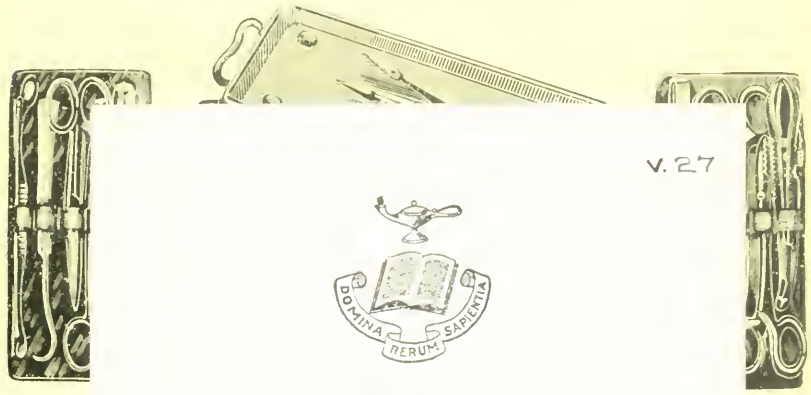
MEDICAL ANNUAL

Aseptic Minor Operating Instruments

WITH

Seamless Metal Case-Sterilizer.



V. 27

DOMINA RERUM SAPIENTIA

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Presented by

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Combined Artery Forceps and Needle Holder.
Straight Aseptic Dressing Scissors.
Curved " " "
Splinter Forceps.
Combined Spatula, Fraenum and Tongue Depressor.
Tenaculum.
Spring Forceps.
Spencer Wells' Forceps.
Pean's Artery Forceps.
Double Volkman's Spoon.
Director and Aneurism Needle.
Two Probes.
Six Operating Knives.
Needle Case with six Needles.

Price for the whole set complete **£2 2s. 0d.** net.

R. SUMNER & CO., Ltd.,

SURGICAL INSTRUMENT MAKERS, LIVERPOOL.

The ever-increasing sale of . . FRY'S MALTED COCOA is largely due to the recommendations of the Medical Profession. . . . .

Fry's Malted Cocoa

A combination of Fry's Pure Cocoa and Allen and Hanburys' Extract of Malt.

THE value of Extract of Malt as a nutritive and restorative agent for delicate and exhausted constitutions is now fully acknowledged by the Profession, the Extract being rich in muscle and fat-forming elements. It promotes, moreover, in a special and peculiar manner, the solution and digestion of all farinaceous foods, and is therefore a valuable remedy in those diseases which arise from an imperfect assimilation of these substances. The presence of the active and valuable constituents of the Malt, unimpaired and in a concentrated form, is secured in ALLEN & HANBURYS' Extract by a very careful selection of the Malt used, and the greatest attention to the temperatures at which the processes of the mashing and subsequent evaporation in vacuo are carried out.

An ordinary portion contains more of the active properties of Malt than a pint of the best ale or porter.

The combination, therefore, of ALLEN & HANBURYS' Extract of Malt with FRY'S Pure Cocoa Extract supplies to Invalids and all those possessed of weak digestive powers a delicious, refreshing and invigorating beverage for breakfast, luncheon, or supper.

Both of its constituents being highly concentrated, the MALTED COCOA is economical in use, and possesses highly nutritive properties, and on this account can be recommended with great confidence to the public.

Makers to

. H.M. THE KING, H.M. THE QUEEN, .
. . H.R.H. THE PRINCE OF WALES, . .
AND OTHER ROYAL HOUSES OF EUROPE.

☞ **Members of the Profession are cordially invited to write for Samples to—**

J. S. FRY & SONS, LTD., BRISTOL.

300 GRANDS PRIX GOLD MEDALS, &c.

THE

"LAWSON TAIT"

Spring Bedsteads.

TRADE MARK.

PERMANENT GUARANTEE GIVEN WITH EACH BED.

Illustrated Catalogue of Designs, also List of Public Institutions supplied, with Testimonials received, sent free on application.

The Patent Spring Meshes on these Bedsteads are guaranteed to stand this test (780 lb.) without injury.

Bedsteads for *special purposes* made to order.

ESTIMATES FREE.

Specially adapted for Hospitals, Asylums & Public Institutions,

Supplied to St. Thomas's Hospital, University College Hospital; North London Hospital; Royal London Ophthalmic Hospital, St. George's Hospital; Queen Charlotte's Hospital; Charing Cross Hospital; Great Northern Hospital, etc.

All Frameworks have the improved smooth castings whereby Dust and germs of Disease are readily removed by a Duster.

The DIAGONAL construction of the Mesh gives the greatest resistance in the centre of the bed, where it is most required (Gale's Patent, 3926).

GEO. GALE & SONS, Ltd.,

Dominion Works, BIRMINGHAM.

For Constipation, Gout & Rheumatism, Liver Complaints, Obesity, &c.,

PRESCRIBE

Hunyadi János

THE BEST NATURAL APERIENT WATER.

Directions for Use.

Dose.—To relieve constipation the average dose for an adult is from a third to half a tumbler, taken on an empty stomach on rising. To obtain the depurative and tonic effects in dyspepsia, biliousness, congestion of the liver, &c., a quarter of a tumbler should be taken every morning before breakfast.

"Hunyadi János" may be taken pure or mixed with hot or cold water. If hot water be used the temperature should be high enough to make the mixture as hot as can be drunk comfortably. If cold, the water should be at the ordinary temperature, that is to say, not iced or ice-cold.

A draught of pure water, hot or cold, taken immediately after, increases the efficacy of the laxative and obviates any after-taste.

For Children.—The dose is proportional to the age. Between 5 and 10 years of age from one to two teaspoonfuls of the water which may be mixed with milk, will be sufficient. Above 12 the dose is a quarter of a tumbler, taken as above.

N.B.—When administered to persons in bed, somewhat larger doses are required to produce the same effect.

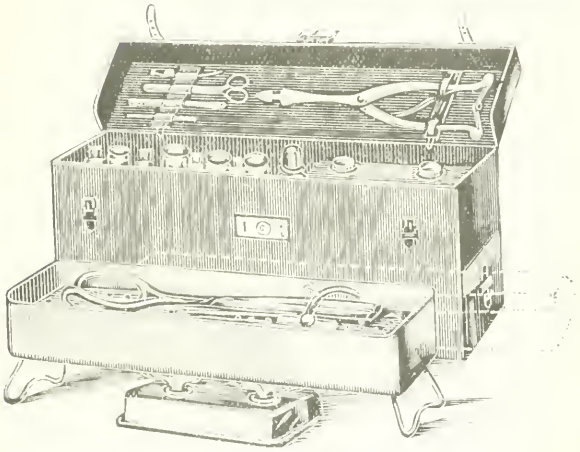
PROPRIETOR -

ANDREAS SAXLEHNER, BUDAPEST.

LONDON Agency: Trafalgar Buildings, Charing Cross, W.C.

Modern and Improved

MIDWIFERY BAG WITH STERILIZER.



The bag is made of solid leather having a compartment beneath into which the Sterilizer fits.

The Sterilizer has no seams, being blocked out in one piece from a solid metal sheet and heavily nickel plated.

The larger instruments are carried in Sterilizer, the top portion being reserved for Nail Brush, Lamp, Chloroform Bottle, Pill and Medicine Bottles, Dredger, leaving room for Apron, Gloves, &c.

The inside Cover has loops arranged for carrying the smaller instruments.

PRICE of the Bag, together with Sterilizer, Lamp, Nail Brush in plated case, Minim measure in case, Chloroform Bottle in plated case, Dredger, 3 Pill Bottles, 3 Medicine Bottles.

£3 3 0 net (with outside Canvas Cover **7/6** extra.)

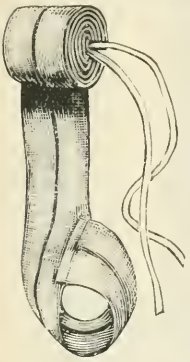
R. SUMNER & CO., Ltd.,

SURGICAL INSTRUMENT MAKERS, LIVERPOOL.

THE

"PUTTEE" LEG BANDAGE

FOR VARICOSE VEINS, etc.



THESE are Elastic Bandages fitted with a loop for the foot, and tapes for tying.

The advantage is that the bandage is always retained in position.

They are preferable to an Elastic Stocking as they can be adjusted to any required pressure, and are cooler and lighter in weight.

They require no measurements or fitting, and are very much cheaper.

WE MAKE IN TWO SIZES.

To reach the Knee (9 feet by 2½ inches), 2/- each.
To reach the Thigh (13½ feet by 2½ inches), 3/- each.

SPECIAL SIZES MADE TO ORDER.

R. SUMNER & CO., LTD.,
LIVERPOOL.

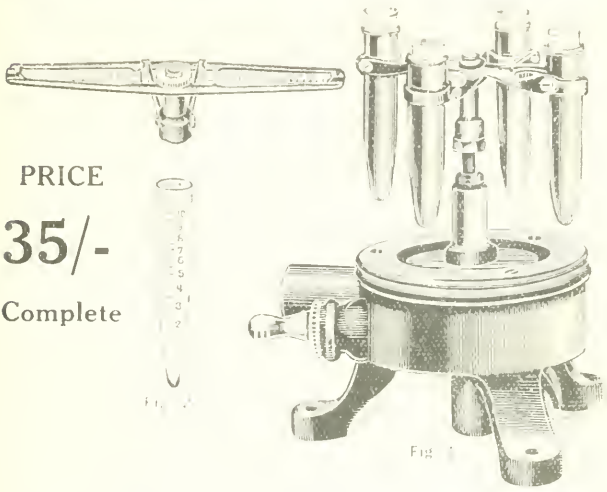
SUMNER'S

WATER-MOTOR CENTRIFUGE

PRICE

35/-

Complete



PRICE

35/-

Complete

For the Physician this is the most complete, convenient and economical form of Centrifuge. It is a cast iron, aluminium painted machine, well-made, of simple construction, and which does not get out of order.

It has a 4-arm Aluminium Gallery fitted with aluminium tube-carriers, and is supplied with :—

2 GRADUATED TUBES (*Fig.* 2) ; 2 UNGRADUATED TUBES ; HÆMATOCRIT (*Fig.* 3).

By the use of the Hæmatocrit a rapid and accurate estimate of the **red corpuscles in the blood** is obtained.

Sedimentation of Urine for microscopic examination, which under ordinary circumstances takes at least 24 hours, is produced by means of the Centrifuge in a few minutes.

Directions for the estimation of **fat in milk,** the isolation of **bacteria, blood, pus,** etc., in Urine, and other examinations in which this Centrifuge is of use, are supplied with the Instrument.

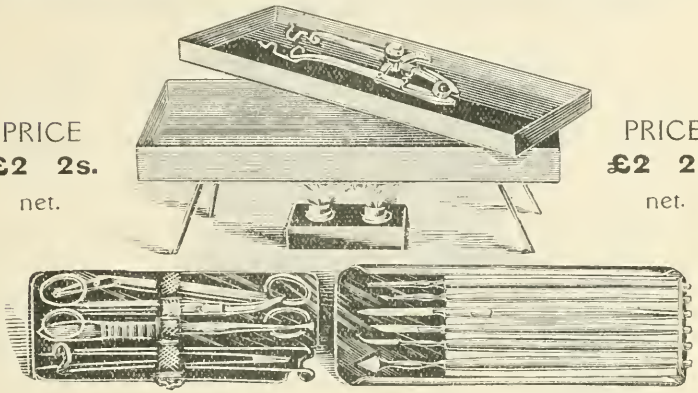
R. SUMNER & CO., Ltd.,

SURGICAL INSTRUMENT MAKERS, LIVERPOOL.

SUMNER'S

Aseptic Eye Instruments in Metal Case-Sterilizer.

PRICE
£2 2s.
net.



PRICE
£2 2s.
net.

This Case has been devised for the use of Practitioners who perform minor operations on the Eye. The Instruments, which are of the very best finish, when not in use are carried on Electro-Plated Trays in the Metal Case, which Case can be used also as a Sterilizer. This method was adopted in our Minor Operating Case (see front outside cover), and has met with the unqualified approval of many hundreds of medical men.

The following are the Instruments contained in the Case :—

IRIDECTOMY KNIFE
WEBER'S CANALICULUS KNIFE
GRAIF'S CATARACT KNIFE
IRIS FORCEPS
IRIS SCISSOR (curved on flat)
CLARKE'S SPECULUM
SCALPEL
BIER'S CATARACT NEEDLE
GOUGE
PELLIER'S RETRACTOR
FIXATION FORCEPS WITH CATCH
IRIS SCISSOR (Elbow)

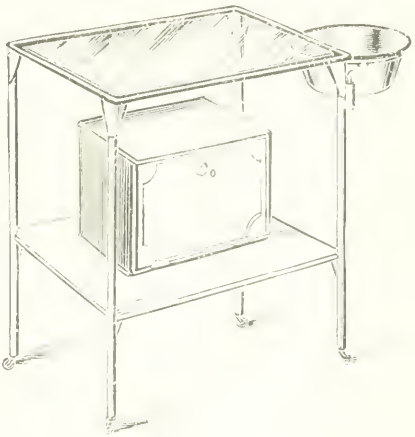
All fitting together with Stand and Lamp into outer Chamois Bag.

R. SUMNER & CO., Ltd.,

SURGICAL INSTRUMENT MAKERS, LIVERPOOL.

ASEPTIC DRESSING TABLE.

SUMNER'S CHEAP ENAMELLED METAL TABLE, WITH BANDAGE CABINET COMBINED.



IT has a Plate Glass Top, and a Metal Shelf underneath, upon which rests a metal Lock-up Storage Box for Dressings, etc. It is also provided with a Bowl for Antiseptic Solution.

A handy ornamental, useful, much desired addition to any Surgery or Consulting Room.

PRICE - - £2 15 0

Carriage Paid to any Station in the United Kingdom.

Measurement of Table: Length, 22 in.; Breadth, 17 in.; Height, 31 in.
,, ,, Box ,, 18 in.; ,, 11 in.; ,, 11½ in.

R. SUMNER & CO., Ltd., LIVERPOOL

IMPROVED

"ALFRADINE" INSTEP ARCH SOCK.

THE BEST SUPPORT FOR FLAT FEET.

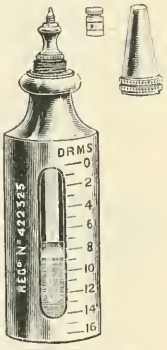
The great advantages of these Socks are their strength combined with extreme lightness, the metal supports being made of aluminium. Again, the leather portion being in one piece, can be trimmed to any shaped boot.

PRICE - - **4/6** per pair.

N.B.—When ordering please state size of boot worn by patient, and also if for lady or gentleman.

"Metaline" Chloroform Drop Bottle

With SYMON'S STOPPER & CAP.



These Bottles consist of a stout outer metal case, nickel-plated, in which a strong amber colored bottle is fixed. The union between the neck of the bottle and metal case is affected by means of metal cement. The bottle is graduated in drachms, to 16, and a window is provided in the metal outer case, so that the Chloroform can be easily seen. They form a very safe method of carrying chloroform in Surgeon's bag, and for its administration.

PRICE - - **7/6** each.

,, 2. Argyrol 20 ,, ,,
,, 3. Atropine 4 ,, ,,
,, 4. Atropine and Cocaine, ā ā 4 grains to 1 oz.
,, 5. Cocaine, 4 grains to 1 oz.
,, 6. Eserine, 2 ,, ,,
,, 7. *Hydrarg. Oxid. Flav., 4 grains to 1 oz.
,, 8. * ,, ,, ,, and Cocaine, ā ā 4 grains to 1 oz.
,, 9. Ung. Pagenstacher, 16 grains to 1 oz.
,, 10. * ,, ,, 16 ,, ,,

(*Prepared from the moist freshly precipitated Oxide.)

Price 1/6 per box of six Capsules.

Ophthalmic Ointment Capsules, containing private formulæ, can be prepared at short notice.

R. SUMNER & CO., Ltd.,

PHARMACEUTICAL CHEMISTS, . . . LIVERPOOL.

Coats for Surgeons and Accoucheurs, Gowns in Attendance on Infectious Cases.

Fig. 3.
OVERALLS, with Helmets, for infectious cases.
Price 12 6 each
Measurement required: Circumference round neck and chest, length of sleeve, and length of overall desired.

Fig. 2.
COAT, with three pockets.
Price 15 - each
Measurement required: Circumference at chest, length of sleeve, and length of coat desired.

proof material that can be washed and treated with antiseptics. of 212° F., and therefore can easily be rendered aseptic.

upon which rests a metal Lock-up Storage Box for Dressings, etc. It is also provided with a Bowl for Antiseptic Solution.

A handy ornamental, useful, much desired addition to any Surgery or Consulting Room.

PRICE - - £2 15 0

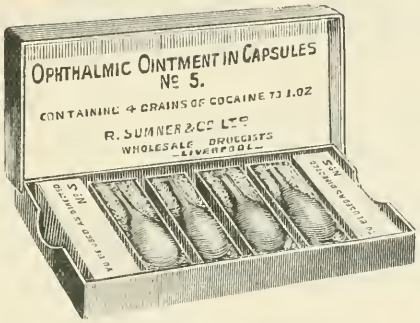
Carriage Paid to any Station in the United Kingdom.

Measurement of Table: Length, 22 in.; Breadth, 17 in.; Height, 31 in.
,, ,, Box ,, 18 in.; ,, 11 in.; ,, 11½ in.

R. SUMNER & CO., Ltd.,
LIVERPOOL

OPHTHALMIC OINTMENT

— IN GELATINE CAPSULES. —



THESE Capsules are specially designed for Eye Ointments, having a soft gelatine elongation which permits direct application of Ointment to the Eye without danger of injury. Each Capsule is enclosed in a small box, bearing only the reference number, and labelled "To be used as directed" *(see illustration)*.

Directions for Use.

Cut off the extreme end of the elongated tube with scissors or knife, slightly press the Capsule until the required quantity of Ointment exudes.

The following formulæ are kept in stock:—

No. 1. Boric Acid, 20 grains to 1 oz.
,, 2. Argyrol 20 ,, ,,
,, 3. Atropine 4 ,, ,,
,, 4. Atropine and Cocaine, ā ā 4 grains to 1 oz.
,, 5. Cocaine, 4 grains to 1 oz.
,, 6. Eserine, 2 ,, ,,
,, 7. *Hydrarg. Oxid. Flav., 4 grains to 1 oz.
,, 8. * ,, ,, ,, and Cocaine, ā ā 4 grains to 1 oz.
,, 9. Ung. Pagenstacher, 16 grains to 1 oz.
,, 10. * ,, ,, 16 ,, ,,

(*Prepared from the moist freshly precipitated Oxide.)

Price 1/6 per box of six Capsules.

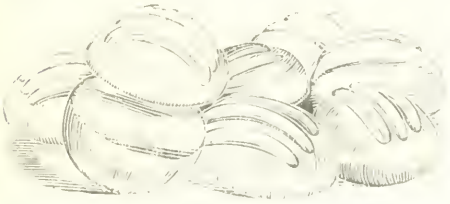
Ophthalmic Ointment Capsules, containing private formulæ, can be prepared at short notice.

R. SUMNER & CO., Ltd.,

PHARMACEUTICAL CHEMISTS, . . . **LIVERPOOL.**

PASTILLES

GLYCERIN HEROIN COMP.



COMPOSITION.

Ammonium Hypophosphite,
Prunus Virginiana,
Hyoscyamus Niger,
Pinus Strobus,
Tolu,
Glycerine,

And Heroin Hydrochlor. 1/120th grain in each Pastille.

This combination has proved of the greatest value in pulmonary affections. Heroin Hydrochlor. possesses a more pronounced sedative effect on the organs of respiration than even Morphine or Codeine, and is certainly less dangerous.

There is a small quantity of Liquid Extract of Hyoscyamus present, ¼ minim in each Pastille: this acts as a local analgesic. The Virginian Prune and Ammonium Hypophosphite are powerful expectorants, whilst the balsamic properties of the Pinus Strobus and Tolu are soothing and antiseptic to inflamed mucous surface.

In the form of a Pastille, these drugs are especially efficacious in Cough and Bronchial Affections, and can be particularly recommended to check the exhausting cough of Phthisis. They have the advantage over the liquid preparation as they dissolve slowly in the mouth, and so, being kept in contact with the mucous membrane, their beneficial action is considerably prolonged.

DOSE OF THE PASTILLE. One or two every hour until the sedative effect is obtained.

PRICE - - - - - - **4/-** per lb.

R. SUMNER & CO., Ltd.

Wholesale Druggists,

LIVERPOOL.

"ERYTHEMOL."

(REGISTERED.)

AN ANTISEPTIC SEDATIVE AND DESICCANT OINTMENT, CONSISTING OF A COMBINATION OF SEVERAL SYNTHETIC COAL TAR DERIVATIVES WITH A WOOL FAT AND PETROLEUM BASE.

IN its process of manufacture "ERYTHEMOL" is subjected to continuous milling for a prolonged period, and by this means it is entirely freed from particles and brought to a homogeneous consistency, a property of the highest importance in an ointment.

INDICATIONS.

"ERYTHEMOL" has been used in the treatment of both forms of **Eczema** with most successful results, its strong antiseptic action, combined with its value as a sedative in allaying the irritation, produces marked curative effects in most obstinate cases.

It is also recommended, especially in combination with 2% Cocaine Hydrochloride, for the relief of **Pruritus Ani, Pruritus Vulvæ,** etc.

"ERYTHEMOL" is useful as a dressing in **Minor Operations, Burns, Abrasions,** etc., as it prevents infection and causes rapid granulation.

Acne, Furuncle, and forms of superficial suppuration quickly desiccate under the application of "ERYTHEMOL." **Chronic Ulcers** show considerable improvement by its use.

PRICE 3/6 per lb.

1-oz. pots for Dispensing, labelled—
"The Ointment, to be used as directed," 6/- per dozen.

Combined with 2% Cocaine Hydrochloride, 9d. oz.

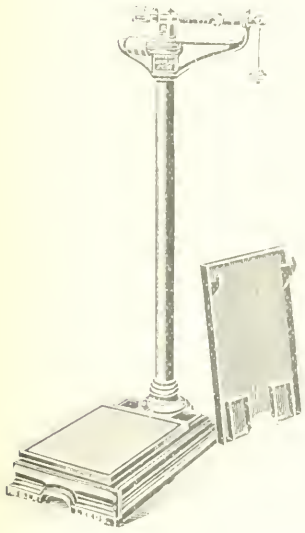
R. SUMNER & CO., Ltd.,

PHARMACEUTICAL
. . . CHEMISTS, . . . LIVERPOOL.

The R. & B.

PERSONAL
Weighing Machine

Specially designed to meet the Board of Education requirements for the Medical Inspection of School Children.



HEIGHT, 4 FEET.
TO WEIGH UP TO 24 STONES.

Fitted with our Patent PROTECTING PLATFORM, beneath which are receptacles for all loose parts; Platform with lock and key.

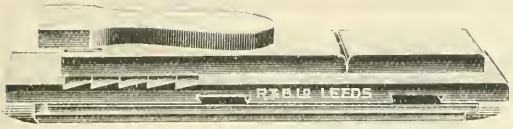
NEATLY JAPANNED.

PRICE - **£2 17s. 6d.** EACH.

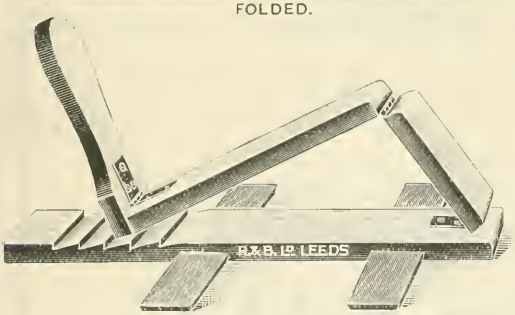
Special Quotation for Larger Quantities.

HEIGHT MEASURING STANDARD, graduated in English or Metric Systems, or both, can be supplied fitted to the above,
£3 10s. Complete.

REYNOLDS & BRANSON, Ltd.
LEEDS.



FOLDED.



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SPLINT,

HERLEY'S.

Double Inclined Plane.
Will fold for storage.

Four Sizes :
17, 20, 23, 27 ins.,

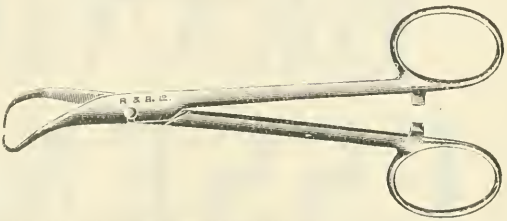
Each **9s. 6d.**

No. 1502.

FORCEPS, TOWEL.

MOYNIHAN'S.

6½ inch, each **7s. 6d.**

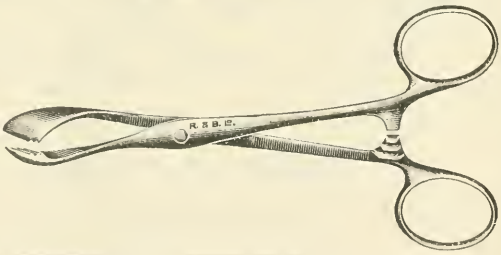


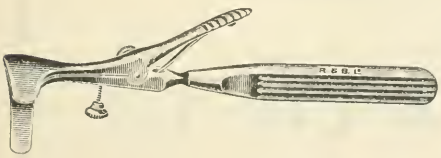
No. 1503.

FORCEPS, TOWEL.

MICKULITZ'S.

5½ inch, each **7s. 6d.**





No. 1504.

SPECULUM, NASAL

KILLIAN'S.

Half Blade, for use with Cautery, etc.

Each - **12s. 6d.**

REYNOLDS & BRANSON, Ltd.

LEEDS.

By Royal Warrant to His Majesty the King.

. . . TWO GRANDS PRIX . . .
FRANCO BRITISH EXHIBITION.

BRAND'S ESSENCE

FROM FINEST BRITISH BEEF.

FOR ALL CASES OF
EXHAUSTION AND . .
WEAK DIGESTION . .

BRAND & CO., Ltd.,

MAYFAIR WORKS.

VAUXHALL, S.W.

"Maltine"

With COD LIVER OIL

FORMULA :

"Maltine" - - - -	70 %
Pure Norwegian Oil - -	30 %

DOSE. Adults—A Dessertspoonful to a Tablespoonful three times a day directly after meals.

Children—In proportion.

THIS combination long known to the Medical Profession throughout the world, as a standard preparation, presents Cod Liver Oil in a perfectly palatable and assimilable condition.

The difficulty of exhibiting Cod Liver Oil in an elegant and non-separable form, is here absolutely overcome by the improved "Maltine" Vacuo process.

The Oil is in perfect molecular combination, and **does not separate out on standing,** while the taste and odour are admirably disguised.

Being prepared, bottled, and sealed in vacuo, oxidation in the bottle is prevented, and the original elegance of the product is thus preserved.

"Maltine" with Cod Liver Oil is semi-fluid, and easily poured out from the bottle. **In practice it will be found that this product is retained and assimilated by those to whom all other forms of oil are absolutely repugnant.**

In prescribing, kindly specify in writing, "MALTINE COMPANY."

The Maltine Manufacturing Co. Ld.

24 & 25, Hart St., BLOOMSBURY, LONDON.

Telegraphic Address MASTOID, LONDON. Telephone No. 2651 Gerrard.

J. H. MONTAGUE,

Surgical Instrument Maker and Cutler.

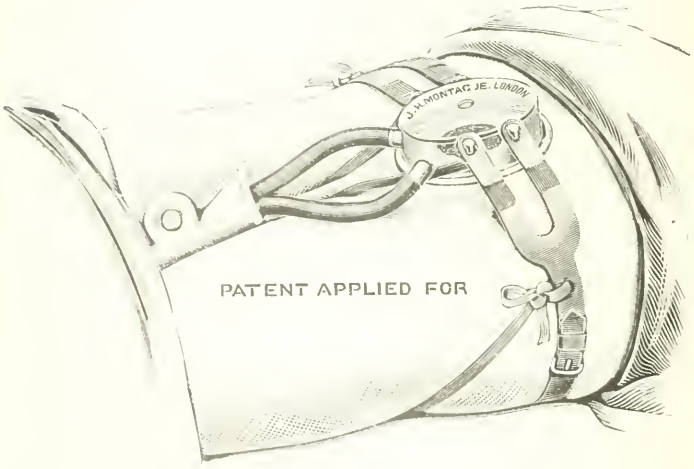
BY APPOINTMENT TO
The Honourable Council of India; St. George's Hospital; St. Peter's Hospital, etc., etc.

THE NEW SUPRA-PUBIC

DRAINAGE APPARATUS.

Devised by Dr. HAMILTON IRVING.

Vide *The Lancet*, December 21st, 1907.



A Simple Method of keeping the patient dry and comfortable after the Operation of Supra-pubic Cystotomy.

PATENTED BY THE MAKER.
Full Particulars sent on Application.

Factory: Horse Shoe Yard, Brook Street.

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MEDICAL ELECTRICAL APPARATUS

HIGHEST QUALITY ONLY .

MADE THROUGHOUT AT THEIR OWN WORKS BY

NEWTON & Co.,

Scientific Instrument Makers

BY SPECIAL APPOINTMENT TO
H.M. THE KING.
H.R.H. THE PRINCE OF WALES.
The Admiralty, The War Office,
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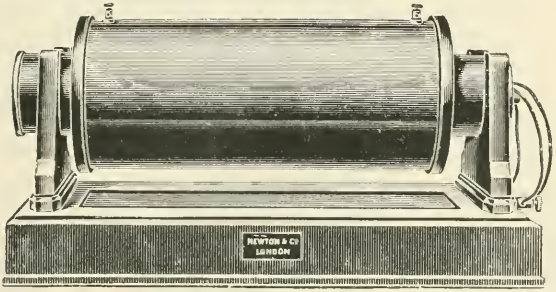

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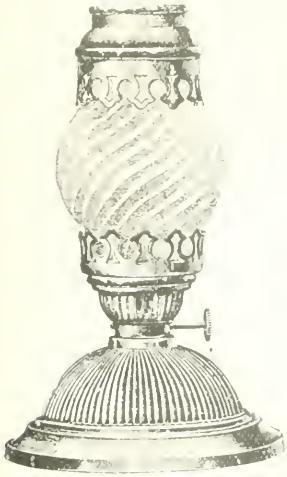

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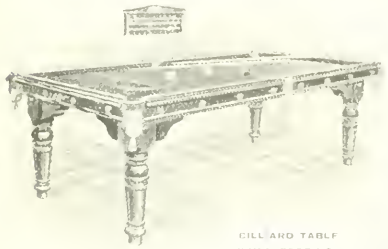

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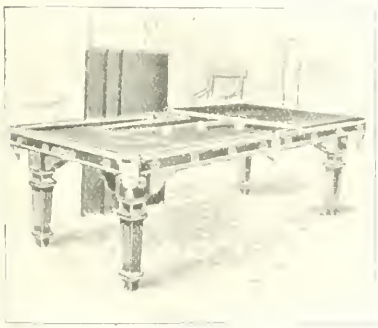

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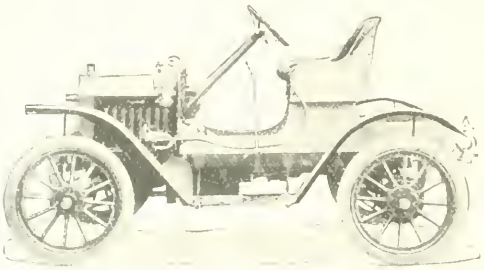

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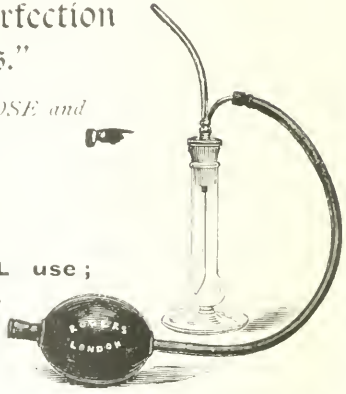

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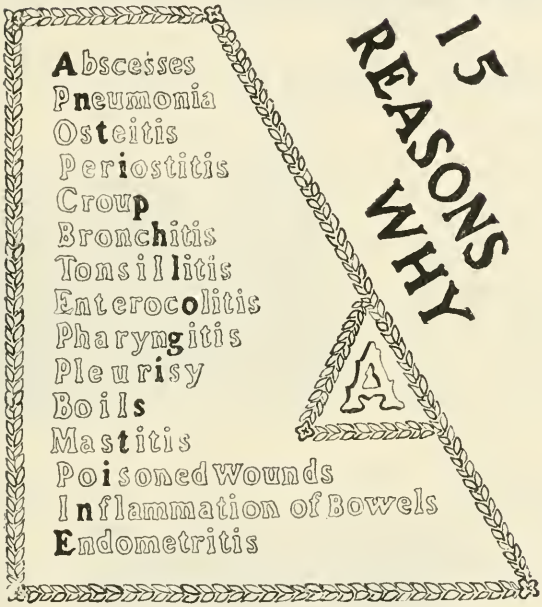

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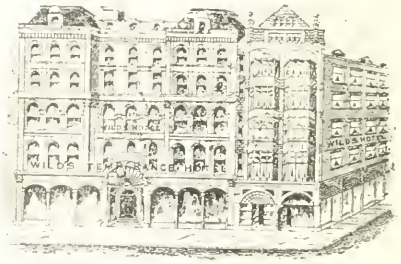

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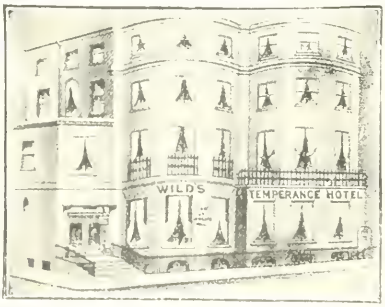

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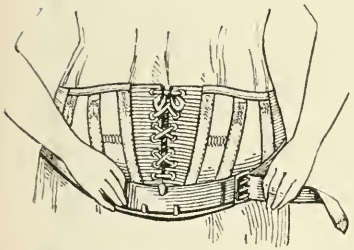

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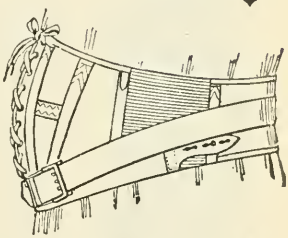

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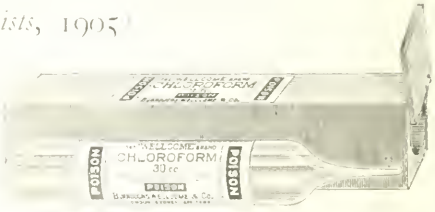

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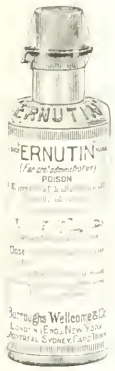

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- *LANCET*, December 5, 1908, pages 1656-1658

SLEEPING SICKNESS
- *QUARTERLY REPORT on the Progress of Segregation Camps and Medical Treatment of Sleeping Sickness in Uganda*, ending February, 1908, pages 27, 28 and 29

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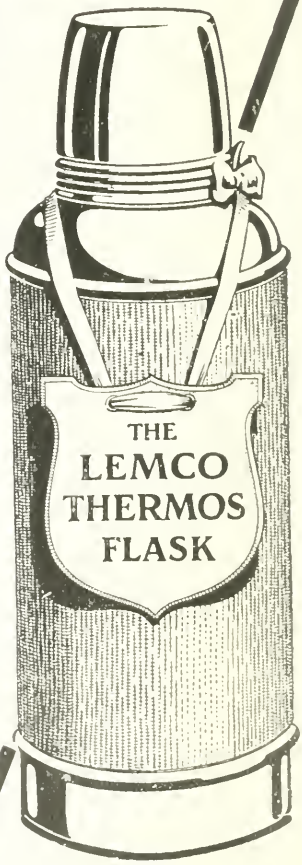

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To the Profession in all parts of the world, whose kindly help has enabled us to produce both illustrations and text, we must express our grateful thanks.

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ROYAL EXCHANGE ASSURANCE.

A.D. 1720.

Governor:
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THE MEDICAL ANNUAL.

Part I.—The Dictionary of Materia Medica and Therapeutics.

REVIEW OF THERAPEUTIC PROGRESS, 1908,

BY

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GENERAL REVIEW.

No great advance in therapeutic knowledge falls to be recorded in the period under review. Comparatively few new drugs have been introduced, and none of them appear to be of much interest. Already some of the recent drugs so enthusiastically praised on their introduction are found to be by no means free from unpleasant side actions. The ferment treatment of cancer is seemingly already being abandoned. Atoxyl is still being extensively tried in various protozoal infections, and many are using it in the treatment of syphilis, but the more recent reports are not very favourable.

The use of lactic-acid curdled or soured milk has been attracting attention. For some time it has been employed in France, and good results are claimed from such curdled milk in various gastro-intestinal conditions. It is hardly to be expected that any great benefit will result from the use of such curdled milk. It seems clear that the lactic acid bacilli readily become acclimatized in the intestinal tract and can be demonstrated in the fæces after a few days use, but the further statement that the reaction of the fæces is rendered acid does not seem to have been substantiated by several independent observers.

In serotherapy there is also little to record. The more recent forms of serum employed in cerebrospinal meningitis lead one to hope that an efficient antiserum for this disease will soon be available. None of the antigonococcic sera at present on the market seem to possess much action, but the serum treatment of dysentery seems to be gaining ground.

DICTIONARY OF REMEDIES.

ADRENALIN.

In extreme **Anæmia from Bleeding** Latzko[1] used intravenous injections of physiological saline solution, with the addition of 10 or 12 drops of adrenalin to the litre. Immediate improvement was seen, which lasted for two hours, after which the effect passed off, so that a second injection was required. In each case 1 litre was injected, but the improvement was not due to the mechanical effect of the fluid, as it appeared after the injection of only 2 or 3 drachms.

The intravenous injection of adrenalin readily produces atheromatous changes. This occurs even if the extract of mistletoe, an efficient lowerer of blood-pressure, is simultaneously employed. The conclusion of Gautier[2] is therefore that the atheroma is due to a toxic influence more than to a vasoconstricting effect. [This conclusion seems warranted by the work of Etienne and Parisot, who found that pituitary extract, which causes permanent rise of blood-pressure, is not associated with atheromatous change in the vessels.]

REFERENCES.—[1]*Sem. Méd.* June 7, 1908; [2]*Quinz. Thérap.* July 25, 1908.

AIR.

Gubb[1] recommends subcutaneous injections of air as a means of relieving certain painful manifestations, according to the method originally introduced by Cordier. The procedure is simplicity itself. The pumping apparatus is supplied by an ordinary rubber bulb provided with an elastic reservoir such as is used for Paquelin's thermocautery, a length of rubber tubing in which is inserted a glass bulb filled with sterilized cotton and an iridio-platinum needle. The latter is sterilized just before use by heating in the flame of a spirit lamp. The fingers of the operator and the skin of the patient must of course also be sterilized. It is well to have an idea of the cubical capacity of the bulb, in order to know how much air has been introduced. The needle is plunged through the skin over the seat of the pain: then, after waiting a few moments to see that no blood exudes, showing that the needle has not entered a blood-vessel, the insufflation is commenced. This should be done gently, very slight pressure sufficing to overcome the elasticity of the skin. A rounded swelling forms about the seat of puncture, and when the air reaches a vascular or nervous sheath it rapidly spreads along it, and secondary swellings may form at a distance. These secondary ramifications are specially apt to form in the limbs, where the sheaths are more numerous. The skin at first becomes blanched, but this soon gives place to a pronounced redness which persists for some hours. The air takes several days to undergo complete absorption, and under the influence of muscular contraction travels far and wide, so that the characteristic crepitation of "surgical emphysema" may be felt at spots distant from the seat of the original injection. No pain whatever is experienced, even when comparatively large quantities of air are injected—at most a sensation of distention, "pins and needles," or pin pricks. Cutaneous sensibility is at once

diminished, the skin becoming more or less numb. The needle having been withdrawn and the puncture sealed by a drop of collodion, the next step is to massage the part. The subcutaneous air must be alternately dispersed and brought together again, especially over the painful spots. This massage is an indispensable part of the procedure, and must be repeated daily as long as any resonance remains.

The procedure is applicable to the relief of pain due to all forms of **Neuralgia and Neuritis.** The only precaution is to vary the quantity of air injected according to the anatomical structure of the part. For instance, we may inject 200 or 300 cc. of air in the gluteal region, while over the thorax from 10 to 30 cc. will be enough. In the neuralgic pain that follows extensive zona it is best to make several small injections, one over each painful spot. In intercostal neuralgia one small injection behind, near the vertebral column, should be made, and another in front, about 2 in. from the middle line. In the treatment of sciatica the injections should be made in the lumbar region, on the outer side of the thigh, and on the supero-external part of the leg, round about the head of the fibula, as well as over any painful spots in the lower part of the leg and the dorsum of the foot, to be followed in every instance by systematic massage.

REFERENCE.—[1]*Brit. Med. Jour.* Nov. 9, 1907.

ALCOHOL.

Kesteven[1] has investigated the so-called stimulating effect of alcohol upon protoplasm by placing actively moving amœbæ in contact with alcoholic solutions of various strength. He concludes: It was evident that although these animals could live in solutions of alcohol which did not exceed 5 per cent, yet the effect upon them was in all cases the same, it being simply a question of the degree of paralysis induced. There was absolutely no sign of any stimulating effect. Torpor, followed in many cases to which the weaker solutions were applied by what is known as alcoholism, was the rule; and if life was maintained, it was rarely as vigorous as before the alcohol was added to the medium in which the creature was living.

The effect of small doses of alcohol upon the power of resisting infection of the animal so treated and the effect upon the descendants has been experimentally investigated by Laitinen[2] on rabbits and guinea-pigs. He used a very small dose, not exceeding 0·1 cc. absolute alcohol per kilo. body weight, about equal to one glass of beer for an average man. Even this small quantity produced distinct deleterious effects. The animals so treated were less able to resist diphtheria than control animals. Further, the proportion of stillborn descendants was numerically greater, and the growth of those which survived was at a distinctly slower rate than in the descendants of the controls.

Finlay[3] gives the following rules regarding the use of alcohol: (1) Regard alcohol as a drug—a very valuable and dangerous one,—and put it in the same category as morphine, strychnine, atropine, and the like. If you look upon it as a drug you will probably not go very far

wrong. (2) Prescribe it with a due sense of responsibility, and not after a routine method, having regard to each case on its own merits, and considering such points as the state of the pulse especially, the age, previous health and habits, and the severity and period of the attack. (3) Young patients of good constitution are better without it, except in presence of heart failure or crisis of some kind. (4) Use the smallest doses possible, and give strict injunctions as to time and mode of administration. Watch its effects carefully, and omit it when the critical condition has passed. (5) Be especially sparing in chronic diseases, where in most cases it does not the slightest good, but only leads to waste.

References.—[1]*Brit. Med. Jour.* Ap. 18, 1908; [2]*Zeits. f. Hyg.* 1907, lviii, 1; [3]*Scot. Med. and Surg. Jour.* Dec. 1907.

ALKALIES.

An interesting paper on the effect of the administration of alkalies on the total blood alkalinity has been published by Landau[1]. His experiments were performed on rabbits, and he employed doses corresponding with those which could be administered to human beings. Normal rabbits were given for four succeeding days 4 grams of Na_2Co_3 in the form of a 2 per cent solution, of which half was given by the mouth and half by subcutaneous injection. At the end of this period the blood was examined, one hour after the last injection. The result was negative as regards the total alkalinity, which was not materially increased, but the alkalinity of the plasma and corpuscles was separately examined and in both cases was increased. This apparent abnormal finding is explained thus. The alkalinity of the blood is chiefly due to the corpuscles. After the administration of the alkali the plasma becomes more alkaline (the increase is about 20 per cent of the normal). Owing to the introduction of the water in which the alkali is dissolved the blood becomes hydræmic: consequently a given quantity of blood contains a diminished quantity of corpuscles. As these corpuscles are the chief source of blood alkalinity, the total blood alkalinity is not increased, though both plasma and corpuscles contain more alkali. A further series of experiments was made on animals rendered acidæmic. This can be done in two ways. Prolonged starvation causes acidæmia, from breaking down of the tissues which produce the caloric value necessary to preserve life. In this starvation acidæmia the acidity is due chiefly to sulphuric acid, and perhaps also to some extent to acetone. The resulting acidæmia is comparatively slight. Administration of Na_2Co_3 completely neutralizes it and restores the blood to its normal degree of alkalinity. The other method of producing acidæmia is by administration of phosphorus, which causes a much more profound and progressive acidæmia from toxic destruction of fat and albumin and insufficient oxidation. The acidity is due here to lactic acid and amino-acid formation. In severe progressive acidæmia of this type, the administration of alkali is incapable of restoring the blood to the normal degree of alkalinity. Landau suggests that the acidæmia in diabetes is similar in type to that of phosphorus poisoning, in that it

is excessive and progressive. He thinks that his experimental findings show that in diabetic acidæmia little benefit is to be expected from the administration of alkali, which is in accord with clinical results.

Alkaline Earths.—The carbonates and lactates of magnesium, calcium, and strontium increase the **Coagulability of the Blood** when administered by the mouth in doses of 30 to 60 gr. Nias[2] has undertaken an investigation to determine how far the same property is possessed by other salts of these alkaline earths. The lactate and carbonate of magnesium acted strongly, but borocitrate of magnesium, a soluble salt, is less efficient. Magnesium sulphate has no action on the blood. Magnesium carbonate acts too slowly for the emergencies of hæmophilia, but is suitable for long continuous treatment of other conditions with slow clotting, e.g., urticaria. Bromide of strontium is soporific, but increases coagulation: on the other hand, the lactophosphate and glycerophosphate of lime were inert. Nias' conclusion is that for **Hæmophilia** the lactates, chlorides, and carbonates of the alkaline earths are most suitable, while for urticaria and conditions of general debility we have a rather larger selection of available drugs.

References.—[1]*Arch. f. Exper. Path. u. Pharm.* Mar. 1908; [2]*Lancet*, Jan. 17, 1908.

ALUMINIUM GLYCERIN-PASTE (Escalin).

Klemperer[1] thinks that aluminium in fine powder is a useful substitute for bismuth in gastric affections. A suspension of powdered aluminium introduced into a dog's stomach caused a uniform covering of the mucous membrane with a thick silvery coat, which could not easily be removed by washing. Thus an artificial ulcer was produced in a dog, two hours afterwards the aluminium was administered, and after six hours the dog was killed. The wound was so thoroughly covered that it required prolonged washing and search before it could be discovered. For therapeutic purposes two parts aluminium were rubbed up with one of glycerin into a paste, which on the addition of water readily forms a thick emulsion. Under the trade name "Escalin," tablets containing 2½ grams of finely powdered aluminium made up with glycerin can be bought. Four of these tablets are mixed thoroughly with half a glass of water till a uniform suspension is obtained. The patient drinks this, and takes no food for one to two hours thereafter. The action of the drug is purely mechanical, and no side action is produced. The chief use is in the treatment of **Gastric** and **Intestinal Hæmorrhage.** Klemperer has treated ten cases of **Hæmatemesis** for three weeks with daily doses of 10 grams of aluminium. In no case was there a relapse, and it is noteworthy that evidence of blood in the stool ceased with the appearance of aluminium in the fæces. He treated seventeen cases of **Peptic Ulcer** with aluminium, and finds that the "occult" bleeding ceases after the first or second day. The protection of the aluminium film is so good that he was able to employ immediate gastric feeding without preliminary rectal nourishment. In all cases pain rapidly disappeared.

Reference.—[1]*Ther. d. Gegenw.* 1907, II. 5.

AMYL NITRITE.

Hare[1] suggests the inhalation of amyl nitrite in **Uterine Hæmorrhage.** He has used it in five cases with eminently satisfactory results. In one case of angina pectoris the inhalation of amyl nitrite promptly checked the menstrual flow. It acted well in three cases of menorrhagia. In a case of bleeding from inoperable cancer and another of intramural fibroid the inhalations proved successful. In a case of post-partum hæmorrhage, Colyer[2] tried the inhalation of amyl nitrite, but states that it increased the bleeding.

REFERENCES. [1]*Lancet*, Aug. 8, 1908; [2]*Ibid.* Aug. 22, 1908.

ANTIFORMIN.

Uhlenhuth and Xylander[1] draw attention to this new antiseptic, which seems to possess some remarkable properties. Antiformin is a mixture of alkali hypochlorite and alkali hydrate. The addition of HCl produces 5·3 grams chlorine from 100 grams antiformin. Using phenolphthalein as an indication, the alkalinity corresponds to 7·5 per cent NaOH. The drug, therefore, resembles the well-known Eau de Javelle with free alkali added. In concentrated solution it is a clear yellow fluid with a strong but not unpleasant odour resembling free lye and chlorine. The preparation has already been extensively used in breweries. The present investigation brought to light some interesting effects. The disinfecting power against dried microbes was very marked. Thus a 2–5 per cent solution killed the organisms of cholera, typhoid fever, *B. coli*, *B. paratyphosus*, staphylococci, streptococci, meningococci, and pneumococci, within four minutes, but anthrax spores proved extremely resistant. In albuminous solutions the preparation produces no precipitate. The investigators made the important observation that in watery suspensions of bacteria the addition of antiformin, even in comparatively weak strength, dissolves the bacterial bodies so that a clear solution is obtained. Thus if one takes 2 cc. of 2·5 per cent watery solution of antiformin and rubs up with it a loopful of typhoid, paratyphoid, dysentery, diphtheria, or plague organisms, within ten or fifteen minutes the organisms are completely dissolved and a clear fluid is obtained. Protozoa, e.g., sprochætes and trypanosomes, also rapidly dissolve, but anthrax bacilli are very resistant, and the acid-fast bacilli, e.g., tubercle and smegma bacilli, are completely refractory, and neither go into solution nor are killed, even in concentrated solutions. Consequently antiformin is useless for disinfecting tuberculous sputum. All the other organisms are killed, but the tubercle bacilli survive. In this way it is possible to convert thick lumps of sputum into a fluid, homogeneous liquid. The authors have taken advantage of this fact to free tuberculous material from accompanying bacterial contaminations. Tubercle bacilli are unaffected by twenty-four hours' contact with a 20 per cent antiformin solution. By this time all other bacteria are dissolved. The tubercle bacilli are not affected, and animals inoculated with tuberculous sputum so treated die from tubercle. A similar method

may be employed to free the resistant anthrax spores from contaminating pyogenic organisms which often interfere with animal inoculation tests. The marked dissolving action of antiformin solutions renders them extremely useful for disinfecting fæcal masses, which are reduced to a soft, pulpy, odourless mixture. As excess of alkali masks the action of chlorine, it is well to render the fæcal mixture acid by the addition of a little HCl.

Another important action of antiformin is that of breaking up organic poisons and bacillary toxins and endotoxins, which are rendered inert by contact with relatively weak solutions of antiformin. Thus they were able to inject without damage an antiformin solution of two cultures of a virulent dysentery bacillus, which as a rule killed a rabbit within twenty-four hours in the dose of $\frac{1}{20}$ of a loopful of the killed culture. The same thing holds good for solutions of diphtheria bacilli in antiformin. Animals treated with these solutions develop a high power of agglutination in their serum.

REFERENCE.—[1]*Berl. klin. Woch.* 1908, No. 29.

ANTIMONY.

Eustace Smith[1] puts in a strong plea for an increased use of this old-fashioned drug. He uses it, not to produce any profound sedative effect upon the muscular or vascular systems, but simply to obtain free **Secretions from the Mucous Surfaces** and the skin. For this purpose it is pre-eminent, but should always be given in small doses repeated frequently. In **Acute Bronchitis** it is invaluable for unloading congested vessels and setting up free secretion. The best form to use is the vinum antimonialis in doses of 2 to 3 or 10 to 15 min., according to the age and condition of the patient. This should be given every hour or two hours along with some diaphoretic drug, as long as the symptoms are acute. Great severity in the attack is no bar to its use, but in severe cases it must be pushed with prudent liberality. In the early stages of **Bronchopneumonia** in children, in the stage where consolidation is still in patches before widespread consolidation has taken place, antimony is of undoubted value. It is useful only in the early stages, and should be discontinued directly obvious signs of lung consolidation have become established. In **Laryngismus Stridulus** it is excellent administered in frequent doses of 15 to 20 min. so as to produce slight nausea. In very severe cases one effort of vomiting may be advisable. In older children, a spray containing $\frac{1}{4}$ gr. of tartar emetic in 1 oz. of water may be inhaled with advantage. In minim doses it is a useful gastric sedative, and is of some repute as a hepatic stimulant. In acute and chronic inflammatory diseases of the skin it is one of the most satisfactory internal remedies if continued perseveringly. As an adult dose, 5 min. of the wine in a glass of water taken after meals speedily improves eczema of long standing.

Antimony Chloride seems likely to come into more general use again among dermatologists. McDonald and Hill[2] point out that the solid

chloride differs in its effect from the solution. The latter contains about 30 per cent of antimony chloride and 16 per cent of free hydrochloric acid. The solid substance is strongly escharotic and caustic owing to its affinity for water. Kept in contact with the skin for some time it decomposes into hydrochloric acid and antimony oxychloride, while the action takes place immediately in contact with ulcers or broken skin. The solution is not so caustic. The hands can be washed in it and allowed to dry without more than a slight temporary itching and smarting, hairs and skin being quite unaffected. This local action is the same as that induced by a 16 per cent solution of hydrochloric acid. The application of the antimony solution to **Inflamed Skin** and uncertain **Skin Diseases** is of benefit. It has a selective affinity for tuberculous nodules, causing them to disappear. In **Psoriasis,** application by a glass rod of solid antimony chloride checked the inflammation without causing scars to form.

REFERENCES—[1]*Brit. Med. Jour.* Feb. 29, 1908; [2]*Pharm. Jour.* Jan. 25, 1908.

APOMORPHINE.

Fisk[1] thinks that this drug is neglected by the profession. He specially alludes to the fact that it is not used internally as an **Expectorant.** The doses usually recommended for oral administration are too small. Clinically it is found that relatively enormous doses can be so administered without other important effect than a pronounced expectorant action. He prefers it to any other expectorant when a flow of mucus is desired as in acute or subacute laryngitis, tracheitis or bronchitis where the membrane is dry and swollen, or obstructed by tough mucus. The administration of $\frac{1}{8}$ to $\frac{1}{4}$ gr. every two hours gives prompt relief without any nausea or depression. In bronchial asthma it is useful, and may often replace heroin with advantage, as there is no temptation to form a habit. Given by the mouth it is of no value as a hypnotic and is useless as an emetic, but hypodermically in small doses $\frac{1}{10}$ gr. or more, it is a valuable sedative, and in doses of $\frac{1}{6}$ to $\frac{1}{4}$ gr. an emetic. Crystalline apomorphine hydrochloride should always be used to avoid any risk of morphine contamination.

REFERENCE—[1]*Med. Rec.* Sept. 28, 1907.

ARGILE.

Gorner[1] recommends this substance in the **Diarrhœa of Intestinal Tubercle.** He uses large doses—50 to 100 grams for an adult and 25 grams for children. This dose is suspended in water and taken in the morning on an empty stomach. He claims that it does not upset the digestion or produce flatulence while it is not followed by obstinate constipation. In twenty out of twenty three cases the diarrhœa was checked by the first dose, and if the diarrhœa returned the drug was repeated.

REFERENCE—[1]*Sem. Med.* Dec. 4, 1907.

ARHOVIN.

Nagel[1] has used this drug for the past three years in **Gonorrhœa** of the urinary and genital tracts. Internally he gives two capsules thrice daily, and also uses it locally as vaginal pessaries and bougies. He has never experienced any untoward result, and finds that the cure requires about two to six weeks. The chief effect is relief of pain and decrease of discharge.

REFERENCE.—[1]*Zeits. f. n. ph. Med.* 1908, No. 11.

ARSENIC. (See also article "SKIN")

Dawes and Jackson[1] combat the view of Fraser regarding the lack of therapeutic value of the cacodylate of sodium. In a series of forty-five cases treated by them, thirty-four were cured or much benefited, eleven in no way helped, and two made worse. They ascribe the failures to possible errors in technique. A fresh solution of the drug is made each time by dissolving the necessary quantity in the syringe by plunging it in hot water. Using a long needle, this is injected deeply into the gluteal muscle and causes little discomfort. Almost all patients gain in weight. Three patients noted a marked garlic odour in their breath.

Cerny[2] recommends local applications of powdered arsenious acid in **Septic Infections of the Skin.** A very small quantity is dusted on the wound or applied by a tampon, and then the wound and neighbouring tissue are covered with moist compresses. The As_2O_3 is dissolved, and forms an alkaline arsenite which mummifies the diseased tissue by local abstraction of fluid, while the sound tissues are not affected. He thinks that the blood-vessels are locally dilated and the lymph-channels contracted. Toxic manifestations have not occurred in his experience. He has found the method useful in many cases of **Phlegmon** following small wounds, the acute manifestations subsiding in a day or two.

Gunn[3] finds that arsenic, even in very weak dilutions (1–400,000), has an effect on the red blood corpuscles which renders them less susceptible to the hæmolytic action of distilled water. The action apparently is directly upon the red blood corpuscles, and occurs independently of the presence of serum.

REFERENCES.—[1]*Jour. Amer. Med. Assoc.* June 22, 1907; [2]*Sem. Méd.* 1907, No. 48; [3]*Brit. Med. Jour.* July 18, 1908.

ARSENOGEN.

A new preparation of iron containing arsenic and phosphorus has been prepared by Salkowski.[1] It is obtained by acting upon arsenious acid with freshly prepared paranucleic acid and then precipitating this combination with ammonio-sulphate of iron. In this way a preparation is obtained which is soluble in slightly alkaline fluids. Analysis shows that it contains 16·38 Fe; 1·9 P; 14·11 As; 6·6 N. The arsenic is in loose chemical combination. Experiments show

that rabbits absorb the preparation readily and excrete the arsenic slowly during twelve days or so. The maximum excretion takes place on the second day. The new preparation is but slightly toxic.

REFERENCE.—[1]*Berl. klin. Woch.* Jan. 27, 1908.

ATOXYL.

Hallopeau[1] recommends the local use of atoxyl in **Syphilis.** A 10 per cent ointment of powdered atoxyl (if this is not too irritating) is applied to the primary sore, and 10 cgrams of atoxyl as 5 per cent solution is injected daily in the neighbourhood of the lymphatics coming from the primary sore. Finally, to prevent infection by the blood-stream, bi-weekly injections of 0·35 gram of arsacetine are made into the gluteal region. The local treatment prevents the appearance of the roseolous rash, and any secondary symptoms which appear are less widespread and more fugaceous than usual.

Uhlenhuth and Weidanz[2] find that atoxyl in the form of an ointment is a more reliable preventive than mercury ointments in experimental infection of rabbits. Using local applications of atoxyl, he was unable to infect the anterior chamber of the eye so treated. The untreated eye readily became affected, thus proving that no generalization of the disease had taken place.

On the whole the mature verdict of most clinicians is against the atoxyl treatment of syphilis. Thus H. Curschmann[3] states that in his opinion it neither heals the local manifestations nor prevents infection. He points particularly to the failure of atoxyl in curing the severe secondary symptoms, as moist papules and buccal plaques, which constitute dangerous sources of infection.

Tomasczewski[4] comes to practically the same conclusion. In the first and secondary manifestations in many cases atoxyl has little influence, and in others only very slow improvement is obtained. Especially mucous plaques in the mouth and moist papules about the genitals are resistant to atoxyl, and relapses are apt to appear very soon. On the other hand he considers that atoxyl treatment is a distinct therapeutic advance in **Tertiary Syphilis,** since many forms prove resistant to mixed mercury and iodide treatment, and some of these rapidly yield to atoxyl. Babesch[5] agrees with the statement that atoxyl is of value in tertiary syphilis, while Scherber,[6] Kriebich and Kraus,[7] and Nobl[8] are in general accord that atoxyl is inferior to mercury in the early stages, acting neither so promptly nor so certainly. In a few cases it acts where mercury fails, but in most cases the truth lies the other way about.

Georgopulos[9] has used atoxyl in a few cases of **Malaria,** and states that it had a distinctly beneficial effect. The dose used was 2·5 cc. of a 20 per cent solution (= 0·5 gram). This was injected into the subcutaneous tissues, about two to four hours before a paroxysm, as follows: The first three doses were daily, then followed three given every second day, finally three were given every third day, so that the

whole course lasted eighteen days, during which time four or five grams of atoxyl were used.

Gonder and Dapas[10] used atoxyl injections in two cases of malaria. The parasites disappeared after six injections. There were no ill effects, but the patients refused to continue the treatment.

Babes and Vasiliu[11] find atoxyl very useful in **Pellagra.** In acute cases the improvement was very rapid, but chronic cases required more prolonged treatment. In acute cases two or three injections of 10 cgrams at intervals of five to seven days, usually cured all the symptoms. In chronic cases larger doses, e.g., 10 to 20 cgrams every second day for a series of five injections, proved very satisfactory. The improvement obtained is very rapid, and the hospital period has been markedly shortened by the use of atoxyl, averaging about thirty-four as against sixty-five days under the old form of treatment.

Arensberg[12] has administered atoxyl internally along with Blaud's pill, in a gelatin capsule, to a series of fifty-seven cases of **Anæmia** or **Chlorosis.** The result was quite satisfactory, the hæmoglobin steadily rising from week to week, and as a rule constipation was relieved. Two capsules were given daily containing 0·05 gram atoxyl and 0·3 gram pil. ferri. Larger doses caused gastric disturbance and diarrhœa. To effect a cure, as a rule from 50 to 75 capsules were required.

After the administration of inorganic arsenical preparation arsenic can readily be detected in the hairs, but this is not the case with atoxyl.[13]

Uhlenhuth and Gross[14] investigated the effect of atoxyl on the spirillosis of hens. As a preventive measure atoxyl was not perfect, but it causes a milder and more chronic form of the disease, which eventually results in the production of a high degree of immunity. As a curative agent it is more successful. A single dose of 5 cgrams atoxyl causes the spirochætes to disappear from the blood in twenty to thirty hours, and even severely ill hens recover. The authors hold that the drug hastens the building of parasiticide protecting-bodies, which seriously damage the parasites. At the same time a phagocytosis is aided.

Uhlenhuth, Hübener, and Woithe[15] have tested the action of atoxyl in **Dourine,** using horses, rats, dogs, mice, and rabbits. By atoxyl treatment a horse can be kept alive much longer than in the control without atoxyl, though it is impossible to say if the cure is permanent. In rats and rabbits this seems to be the case, though with the rat treatment requires to be commenced early. Dogs are so intolerant of atoxyl that no benefit is obtained. Gonder[16] comes to the same conclusion regarding piroplasmosis of dogs, which seemed rather to be intensified by atoxyl.

Eye disturbance.—Three cases were quoted by Herford.[17] In one patient who was already suffering from tabetic optic atrophy, almost complete blindness developed within six months after the injection of 4 grams of atoxyl. The second case was that of a woman aged forty-seven, who had been given 5·1 grams atoxyl for secondary syphilis.

In the course of six weeks she became absolutely blind from optic atrophy. In this case the patient had had an inflammatory affection of the eye twenty years before. In a third case—a myopic patient—five injections of 0·5 gram were given for pemphigus vulgaris, when retinal haemorrhages developed, but cleared up without leaving any permanent damage. Herford states that in future great attention must be paid to the condition of the eyes before subjecting a patient to atoxyl treatment. The presence of internal disease of the eye or a history of such disease should be an absolute contra-indication to atoxyl. In a discussion on the drug it was stated that in cases of blindness from atoxyl observed in Central Africa no objective changes could be detected in the eyes, which seems to point to a central lesion, and not to a retrobulbar neuritis, as in tobacco or alcoholic amblyopia. On the other hand, Fahr[19] saw a case of apparent peripheral damage — nasal contraction of field of vision, pallor of optic nerve, and marked constriction of the retinal arteries.

REFERENCES. [1]*Bull. d. l'Acad. de Méd.* July 21, 1908; [2]*Deut. med. Woch.* 1908, No. 20; [3]*Ther. Monats.* Dec. 1907; [4]*Münch. med. Woch.* Feb. 4, 1908; [5]*Spitalbl.* 1908, No. 3; [6]*Wien. klin. Woch.* Sept. 26, 1907; [7]*Prag. med. Woch.* 1907, No. 40; [8]*Wien. klin. Woch.* 1907, No. 44; [9]*Münch. med. Woch.* Mar. 24, 1908; [10]*Wien. klin. Woch.* 1908, No. 23; [11]*Berl. klin. Woch.* Sept. 23, 1907; [12]*Ibid.* 1908, No. 14; [13]*Ther. Monats.* 1908, No. 4; [14]*Arbeit. a. d. Kaiserl. Gesundheits.* 1907, Bd. 27, H. 2; [15]*Ibid*; [16]*Ibid*; [17]*Charité Annalen*, 1908; [18]*Münch. med. Woch.* Feb. 4, 1908; [19]*Deut. med. Woch.* 1907, No. 49.

ATROPINE.

In using atropine as an **Antidote to Morphine**, Roch[1] recommends the use of small subcutaneous doses of 2 mgrams repeated at intervals of thirty minutes till not more than five doses are given. The state of the pupil is the guide. As soon as it commences to dilate and the pulse to become rapid, enough has been given.

REFERENCE. [1]*Rev. Méd. de la Suisse Rom.* 20 Jahrg. H. 4-6.

BANANA.

In consequence of the slow results often obtained in **Tropical Diarrhœa** with the usual treatment of purges followed by mucilaginous drinks, opiates, astringents, milk diet, etc., Collin[1] has on many occasions adopted a diet consisting solely of bananas reduced to a fine *purée* by prolonged boiling. He was led to adopt this plan, in the absence of fresh milk, by a Dutch medical man who had found it successful in Java. The quantity of *purée* varied from 300 to 1000 grams per diem, according to the appetite. The banana diet is indicated in simple diarrhœa, but it is useless in severe cases with symptoms resembling dysentery. Under its influence the stools become less numerous and are firmer. The tenesmus diminishes and the general health improves. The good effect is ascribed to the high content of the banana in starch and sugar.

REFERENCE. [1]*Gaz. hebd. des Sci. Méd. de Bord.* 1907, No. 47.

BARUTIN.

Weidenbaum[1] finds this combination of barium and theobromine valuable as a diuretic in **Uræmic Conditions.** The barium moiety causes a redistribution of the blood, with congestion in the splanchnic area, while the theobromine dilates the renal arteries and so favours diuresis. In symptoms of slight uræmia in chronic nephritis—slight oppression, headache, confusion, etc.—barutin often acts like a charm. He uses a solution of three parts barutin in 200 of water, of which one teaspoonful is given three or four times daily. The only unpleasant side action noted was once when a slight diarrhœa was induced.

Reference.—[1]*Ther. d. Gegenw.* Oct. 1907.

BICARBONATE OF SODIUM.

The results of numerous investigations upon the action of sodium bicarbonate are contradictory. Linossier[1] points out how some of these discrepancies have arisen. His experiments have been spread over long periods, and began with observations upon a subject who showed the phenomenon of merycism. He was thus able to obtain samples of gastric juice at any stage of digestion without having recourse to the stomach tube. According to Linossier's conception, bicarbonate acts in two ways. Its immediate action is chemical and neutralizes any free acid present; secondly, it acts as a stimulant to the gastric juice, increasing the secretion of HCl but not of pepsin. The increased secretion of HCl neutralizes the bicarbonate and eventually leads to an increased amount of free HCl in the stomach, thus aiding digestion. He states that, however introduced and in every dose, sodium bicarbonate stimulates the secretion of HCl. The amount clinically required is in inverse proportion to the quantity of acid present in the gastric juice. Pawlow's experiments he considers fallacious, as they were carried out without the addition of food. If, under the same conditions as Pawlow used, food is introduced along with the bicarbonate, a distinct increase is obtained in the quantity of HCl secreted. It is true that if the salt is directly applied to the duodenal mucous membrane it causes a diminution in the secretion of gastric juice; but this factor never comes into play except in experiments, as the stimulant action on the stomach is always stronger than the depressant effect of the duodenal reflex.

The best method to obtain the increased secretion is to administer the drug in large doses one hour before food. If the dose is small, it can be given immediately before food, remembering the rule that the less HCl the gastric juice contains, the less sodium bicarbonate is required to produce the stimulant action. If it is desired to obtain the direct neutralizing effect of the drug in excessive acidity, the bicarbonate should be given in large doses two or three hours after food, so that the food may leave the stomach before the drug causes a further secretion of HCl.

Reference.—[1]*Ann. de l'Acad. de Méd. Paris*, Ap. 14, 1908.

BISMUTH.

Boehme[1] records two fatal cases of poisoning in infants after the ingestion of bismuth subnitrate for purposes of radiography. Shortly after the administration of the bismuth salt the children became cyanotic, collapsed, and died with signs of methæmoglobinuria. The supposition that the poisoning was due to the formation of nitrous acid was confirmed by detecting this acid in the pericardial fluid and blood of one of the children. Subsequent investigation showed that the formation of nitrous acid depended apparently upon bacteria. The addition of fæcal material of young infants to a suspension of bismuth subnitrate resulted in formation of nitrites, whereas adult fæcal matter had not this effect. The difference depends not upon the diet but on the intestinal flora, since the fæces of adults on a strict milk diet do not form nitrites.

The action of **Bismuth Subnitrate** in certain disorders of digestion consists, according to some investigations carried out by Bong & Son,[2] in the inhibition of lactic acid fermentation. To some extent this inhibiting action is checked by the specific weight of bismuth salt and the tendency it has to form lumps in the presence of albumin. To overcome these objections this firm has prepared pastilles made up with cocoa and sugar, in which the finely-powdered bismuth subnitrate is presented in an emulsified form which they claim enables it to produce a more perfect action.

References. [1]*Mitt. d. Lab. Path. u. Pharm.* 1907, lvii. 5-6; [2]*Allg. Med. Centr.* 1908, No. 18.

BORNYVAL.

This combination of borneol and valerianic acid is recommended by Ewald[1] as a useful sedative in neurotic conditions, either slight or severe. It is a nerve tonic and sedative, uninjurious and remarkably reliable. Ewald finds it useful in **Neuroses of the Stomach and Bowels.** The drug is given as capsules on a full stomach, and is usually well borne.

Sancey[2] has studied the drug carefully. With large doses it produces in animals a general action consisting first of exaggeration of reflexes and convulsions, followed by paralytic phenomena. The excitement stage is due to an action on the cerebral cortex. In the later stages the peripheral motor nerve terminations are paralyzed and the central nervous system is depressed. The heart is slightly slower, but beats more powerfully, and the blood pressure is slightly higher. Respiration is slower, but deeper. Sancey finds bornyval of great use in **Hysteria, Neurasthenia, Insomnia,** and in the **Menopause.** It is an excellent cardiac sedative, but is useless in epilepsy, migraine, and mental disease.

References.—[1]*Folia Therap.* Np. 1908; [2]*Thèse de Lyon*, 1907.

BROMIDES.

Wyss,[1] as the result of an elaborate study of the elimination and retention of bromides, comes to conclusions which rather upset the prevailing theories. According to his view the body is entirely

indifferent to the bromide salt. No cellular structure, especially not the brain or cord, enters into firm combination with bromine, storing it up, while as regards elimination, the kidney plays a passive part. The bromide is excreted in relation to its concentration in the blood. The kidney displays no special selective excretory action. The total quantity of bromide given off in the urine depends on the concentration of the salt in the blood and on the amount of urine secreted. Consequently, as the volume of urine is only about one-tenth that of the other fluids of the body, at first bromide is passively accumulated in the blood and body fluids. Unless some compensating arrangement was made, the result of such an accumulation of bromine ions in the blood would raise its osmotic tension, but this is met by increased elimination of chlorine. With increasing ingestion of bromine more and more chlorine is excreted in the urine. In man, sooner or later, an equilibrium is established between the excretion and ingestion of bromine, so that with the ordinary clinical doses a point is reached at which no more chlorine is got rid of. In animals this is not the case; a bromine equilibrium is never established, and the chlorine deficit becomes steadily larger. When the removal of chlorine reaches a certain point, symptoms of acute poisoning appear. Roughly, they come on when about one-third of the normal chlorine is lost suddenly, or when two-thirds is lost gradually. They are due simply to deficiency in chlorine, and disappear promptly if the animal is supplied with it.

REFERENCE.—[1]*Arch. f. Exper. Path. u. Ther.* Aug. 24, 1908.

BROMOFORM.

Desesquelle[1] recommends a saturated bromoform water in **Sea-sickness.** For adults the dose is one tablespoonful immediately any symptom of sickness is felt. The entire quantity of the solution used during the day for an adult may be 250 grams; for a child of five to ten years old about 200 grams may be given in teaspoonful or dessertspoonful doses during the day. Under five years 40 grams for each year of age may be used.

REFERENCE.—[1]*Gaz. Méd. de Paris*, July 15, 1907, in *N. Y. Med. Jour.*

BROMURAL.

This new hypnotic has the chemical name alphamonobromisovalerylurea $(CH_3)_2$—CH—CHBr—CONH—$CONH_2$. It is easily soluble in water, and has a slight bitter taste, and a faint odour of valerian. It is primarily of use as a **Nerve Sedative** and as a mild **Hypnotic.** Eeckhout[1] finds that in animals the therapeutic dose of bromural acts as a pure hypnotic on the cerebrum, without any preliminary irritation stage. The cord and medulla are not affected. The drug has no cumulative action. Larger doses do not affect the circulation, but depress the respiratory movements both in extent and rapidity.

Cassebeere[2] has used it with success in mild cases of nervousness. It is specially efficacious in all forms of **Nervous Excitability** and **Insomnia** so frequently associated with mental overwork, financial worry, hysteria,

mild alcoholism, excessive use of tobacco, etc., and in the early stages of rest cures for neurasthenia, when a harmless sedative is absolutely necessary. The drug was well borne, causing no gastric irritation, skin-rash, or headache. It can be readily taken dissolved in hot water sweetened with sugar.

Rimck[3] states that the drug has a constant action in checking profuse **Sweating.** The most suitable dose for ordinary cases is 9 gr., but in obstinate cases this may require to be repeated every three to five hours. It is well borne, and often acts best if combined with a diuretic.

He[1] finds that bromural exerts a very constant effect as an inhibitor of secretion from the skin and mucous membranes. As a rule a diuretic effect is produced at the same time. The most suitable dose is 0·6 gram, which in obstinate cases can be given every evening, or may even be repeated at intervals of three to five hours.

Mampell[5] finds bromural very useful in the treatment of children's diseases. It is especially valuable in **Whooping-cough,** and in **Difficult Dentition,** when the children are restless and cry all night. He also advocates it when weaning children who have been in the habit of getting the breast at short intervals throughout the night. The dose is half or quarter of a tablet containing 4 gr. It is best dissolved in water, and then some milk is added, and this is given after a meal.

References.—[1]*Arch. f. Exper. Path. u. Pharm.* 1907, lvii. p. 338; [2]*Montr. Med. Jour.* May, 1908; [3]*Berl. klin. Woch.* 1908, No. 24; [4]*Ibid.* June 15, 1908; [5]*Med. Klin.* 1908, No. 25.

CAFFEINE.

Claret[1] recommends the following solution of camphor and caffeine for hypodermic injection as a **Cardiac Stimulant** in heart disease or infectious diseases. A solution of 0·23 gram each of caffeine and sodium salicylate is made in 1 cc. of water, and this is added to 3 cc. of sterilized glycerin. Then 1·25 cc. of a 10 per cent alcoholic solution of camphor is added. This solution, representing 25 doses, keeps well if placed in a sealed flask. Any precipitate formed readily dissolves if the flask is placed in hot water.

Reference.—[1]*Bull. Gen. de Thér.* Oct. 23, 1907.

CALCIUM.

Using a new method for determining the amount of calcium present in the blood, Boggs[1] has been able to find that the calcium content of the blood can be greatly increased by feeding with calcium. The increase is maintained for several days. Coincident with this increase there is increased coagulability of the blood. Subcutaneous injection had a similar effect. It is probable that small therapeutic doses of certain simple fatty acids, e.g., citric, diminish the calcium content, but to a less degree.

Loper and Boveri[2] have investigated the effect of calcium salts upon the heart and arteries. The metabolism of calcium is not properly

understood. In the first six months of life 1½ grams of calcium are required daily, and thereafter about 1 gram. In the adult this is absorbed in the form of milk, vegetables, meat, etc. Physiologically one of the most important effects of calcium is its stimulant action on the heart. The blood-pressure rises and the pulse is slower. In rabbits the ingestion of large doses of calcium for a month produced an enormous hypertrophy of the heart, so that though small doses stimulate, large quantities are injurious. In health the arteries contain notable quantities of calcium, and this is increased when from intestinal or renal disease, calcium is being imperfectly removed from the body.

Summarizing from a considerable number of cases, Williamson[3] is led to believe that in calcium iodide we have a very real addition to our armamentarium for promoting **Healing of Skin Surfaces.** It seems to act in both young and old subjects, and to maintain its stimulating effect upon growth until healing is completed. The dose needs to be larger than that recommended in the books (½ to 2 gr.). He has found 4 to 8 gr. in water three times a day better than smaller doses. It should be stored in small (½-oz.) bottles of coloured glass, and preferably glass-stoppered. It deteriorates quickly when opened, and seems to vary in quality considerably. A really good maker's calcium iodide, if packed tightly in bottles as above described, seems to keep fairly well, even in India. It should be dispensed in coloured bottles or bottles covered with brown paper.

Calcium chloride was used by Deaderick[4] in four cases of hæmoglobinuric fever without any striking effect. Two cases died with symptoms of continued hæmolysis.

REFERENCES.—[1]*Johns. Hop. Hosp. Bull.* July, 1908; [2]*Rif. Med.* Sept. 7, 1907; [3]*Brit. Med. Jour.* Oct. 5, 1907; [4]*Ther. Gaz. Feb.* 1908.

CALLAQUOL.

Callaquol is a fluid preparation consisting of the ester of oxytricarballyl acid, oleum thymi, and a solution of white soap. Shaken up with four parts of water it forms a white emulsion, which produces local hyperæmia when applied as a wet dressing for a couple of hours or longer. Müller[1] has seen good results follow such application in **Parametritis** and **Perimetritis.** He has also used the preparation diluted with two parts water as a vaginal douche, or in the form of tampons in similar conditions.

REFERENCE.—[1]*Heilkunde*, Mar. 1907.

CANNABIS AMERICANA (Cannabis Sativa).

The official source of cannabis sativa is the Indian drug; that grown in America is usually considered inefficient. Houghton and Hamilton[1] have investigated this point, and find that the American-grown drug is fully as active as the best imported Indian-grown cannabis sativa, as shown by laboratory and clinical tests. Cannabis indica is not a very poisonous substance. They have been unable to find any record

of a fatal case, and a dog to which two ounces of an active U.S.P. fluid extract was injected into the jugular vein was not killed, though it remained unconscious for a day and a half. In testing the activity of preparations of cannabis indica, dogs are used. The test is made with a solid extract. Three typical effects are noted after administering an active extract to a susceptible dog—first, a stage of excitability, then a stage of inco-ordination, followed by a period of drowsiness.

REFERENCE.—[1]*Ther. Gaz.* Jan. 15, 1908.

CARBON DIOXIDE.

Pusey[1] uses frozen carbon dioxide for destroying skin lesions or for producing a violent inflammatory reaction in them. He illustrates this with two cases of extensive hairy **Nævus.** He has also treated **Lupus Erythematosa** and vascular nævus with success. It is ineffective in lupus vulgaris and epitheliomata, but it is a convenient and effective treatment for **Warts, Calluses, Senile Keratosis,** and similar lesions. Carbon dioxide in the liquid form can be obtained in the drums in which it is sold to druggists, and as it escapes from the cylinder it is collected on cloth or chamois skin in the form of a fine snow. This can be compressed and shaped as desired. Its effects depend on the pressure with which it is applied and the duration of the application. By regulating these its destructive action is controllable and can be accurately gauged. With strong pressure, he thinks, freezing to a depth of from $\frac{1}{8}$ to $\frac{1}{6}$ in. can be produced in a few seconds. As a rule he employs just enough pressure to hold the snow firmly against the skin, but varies this sometimes according to the effect desired. Applications for from five to ten seconds are sufficient to remove thin layers of pigment from the skin or to induce an inflammatory reaction for therapeutic purposes, as in erythematous lupus. If prompt action is desired and moderate scarring makes no difference, a vigorous prolonged single application can be made and the work done at once. If deep destructive action is wanted, the application can be repeated on successive days or at longer intervals. Otherwise the application of the snow should not be repeated till the effect of the previous one has disappeared.

REFERENCE.—[1]*Jour. Amer. Med. Assoc.* Oct. 19, 1907.

CASTOR OIL.

In discussing the treatment of **Appendicitis** with castor oil, Sonnenburg and Kothe[1] state that as a general rule castor oil can be safely used if the pulse averages about 92, the temperature does not exceed 99·5 F. and the leucocytosis is not more than 15,000. Provided that the local and general symptoms agree with these evidences of slight inflammation, an expectant treatment with castor oil is justified, and will almost always relieve pain and improve the condition of pulse, blood, and fever. If it does not, we should suspect that there is abscess formation, especially if the leucocytosis steadily increases.

REFERENCE.—[1]*Mittel. a. d. Grenzgeb. d. Med. u. Chir.* 1908, Bd. xix. H. 1.

CHIMAPHILA.

Soules[1] claims to have cured a case of **Diabetes Mellitus** with large doses of this drug. He gave 2 dr. of the fluid extract in a glass of milk at each mealtime. The drug acts best when it is used along with an antidiabetic diet.

REFERENCE.—[1]*N. Y. Med. Jour.* 1907, lxxxvi. 929.

CHINOSOL.

Lorch,[1] in the course of an epidemic of **Cholera Asiatica** in Jaffa, found chinosol a useful antiseptic. He uses the following solution after a preliminary dose of castor oil:—

R Chinosol	1·0–1·5 gram	Aq. dest.	150 cc.
Syrup. Aurantii	180 cc.		

One teaspoonful every hour.

The purer the water used in dispensing, the better the taste, as hard water forms small quantities of oxychinosol, which imparts a sharp taste. In many cases, after a few doses, vomiting and diarrhœa cease, and the patient breaks into an agreeable sweat.

REFERENCE.—[1]*Deut. Aerzte Ztg.* 1908, H. 17.

CHRYSAROBIN.

There seems considerable doubt whether sufficient absorption takes place from cutaneous applications to damage the kidneys. Winkler[1] found that, after internal administration of chrysarobin to rabbits in doses from 1 to 30 gr. for some time, chrysophanic acid appeared in the urine, but no nephritis was caused. On applying a 6 per cent ointment externally no absorption seemed to take place: at least no chrysophanic acid was excreted in the urine. In man he found $\frac{3}{10}$ gr. internally caused no gastro-intestinal disturbance, or the renal excretion of albumin or chrysophanic acid; 1 gr. caused gastro-intestinal disturbance but no urinary change; $1\frac{1}{2}$ gr. was followed by chrysophanic acid in the urine, but there were no albumin or casts. After the application of a 10 per cent ointment no chrysophanic acid appeared in the urine, and apparently the drug is not absorbed from the skin.

REFERENCE.—[1]*Cor.-blatt. f. Schweiz, Aerzte*, Sept. 15, 1907.

COLLARGOL.

Triboulet[1] reports a case of **Empyema** following enteric, in which 2 litres of pus were removed without any resection of rib. During the course of the next two weeks about 200 cc. of 1 per cent solution of collargol were injected into the pleura, each injection being about 20 cc. A cure was obtained in three weeks.

Arnold[2] has used injections of collargol in a series of eighteen cases, but is unable to recommend this method of treatment. In one case of cerebrospinal meningitis no benefit was obtained. In one case of pyæmia and in two of anthrax the effect was doubtful, not any better than is seen under conservative treatment on other lines. In **Enteric** the results were more favourable. Following the injection there was

a distinct fall of temperature, which rose slowly again next day. The diarrhœa was improved, but the clinical course was not shortened. Against these advantages there are certain disadvantages which are serious. Following the injection there is usually a rise of temperature and rigor. In some cases irregularity of the heart developed.

Ricci[3] reports three cases treated by intravenous injections of collargol. The most striking case is one of **Gonorrhœal Endocarditis,** which was cured by six intravenous injections, each of 1 cc. of a 1 per cent solution. The improvement was unmistakable, and after the third injection the temperature was normal. The other two cases were examples of severe gonorrhœal arthritis which yielded to intravenous injections of collargol. The temperature dropped to normal after the first injection (4 cc. of 1 per cent solution). Three injections in all were given in the one case and six in the other.

Riebold[4] also reports good results in **Gonorrhœal Arthritis** from intravenous injection of somewhat larger doses, viz., 4–6 cc. of a 2 per cent solution. As a rule about four or six injections were required to produce a cure. In **Septic Arthritis** benefit is obtained, and often a cure.

Francke[5] also recommends intravenous injection of colloid silver in grave **Infectious processes,** 30 gr. being injected every day or every second day as a 4 to 5 per cent solution. He considers the intravenous injection preferable to inunction or enemata.

Capezzuoli[6] refers to twenty-four cases of **Appendicitis** treated by Moosbrugger with collargol, of which only two died. He gave the drug internally in tablespoonful doses of a ½ to 1 per cent solution every half to one hour, while twice daily 30 gr. of unguentum Credé was rubbed into the skin, and two enemata of 7½ gr. each in 3 oz. of water were given daily. Children received about one-fourth of these doses. In most cases improvement was evident in two days, in the severer cases in from four to eight days.

Bossan and Marcelet[7] claim that injection of collargol in ordinary medicinal doses raises the human phagocytic power against typhoid bacilli and paratyphoid bacilli to a very marked degree, and in decreasing ratio also for diphtheria, colon bacillus, streptococcus, staphylococcus, and anthrax. [The experiments as recorded are not very convincing, and the technique seems faulty in several respects.—F. J. C.]

References. [1]*Jour. d. Prat.* 1907, No. 27; [2]*Centr. f. inn. Med.* Oct. 20, 1907; [3]*Il Polid.* Feb. 1908; [4]*Centr. f. inn. Med.* Nov. 21, 1907; [5]*Med. Klin.* 1908, iv. 12; [6]*Centr. f. d. Ges. Ther.* 1908, xxvi. 13; [7]*Gaz. d. Hôp.* 1908, No. 103.

COMBRETUM SUNDIACUM.

This drug has been recommended as an antidote to opium, and is of value in treating the **Opium Habit.** The plant is a large climber with a long woody stem, often reaching a height of one hundred feet or more. It was accidentally discovered by a party of Chinese woodcutters, who ran short of tea and substituted the leaves of the jungle

plant. They found that it relieved the craving for opium, and now it is extensively used as a cure for opium smoking in the Federated Malay States. Analysis has so far not detected any active alkaloid, but there is apparently a glucoside present. The following description by Silkworth[1] gives the clinical application of the drug :—

" In preparing the drug, the branches and leaves are chopped into pieces about one and a half inches in length ; after drying, the woody portions are separated from the leaves, and both the bark and leaves are roasted, the leaves to a less extent than the bark. Upon completion of this process the two portions are mixed together again.

" The infusion is prepared by taking, for example, 10 oz. avoirdupois of the roasted drug and mixing with about four gallons of water. This solution is kept boiling for three hours, being loosely covered to prevent too rapid evaporation. The liquid is then strained and is ready for use. I do not believe that a fixed rule for prescribing can be laid down, but in general the method of administration to an opium smoker would be as follows :

" Whatever the daily amount of opium the person habitually smokes, that amount is to be mixed with the infusion. The average allowance would be from 60 to 120 gr., although beyond doubt a considerable quantity of the alkaloids are not absorbed into the system of the smoker. If, for example, 120 gr. had been the daily allowance, then two 25-oz. bottles of the infusion A and B are used. Into A is put 120 gr. of burnt opium (that is, prepared the same as if for smoking). From the bottle A, 1½ oz. is given to the patient and 1½ oz. from bottle B is put into bottle A. This is repeated each time a dose is taken, usually three times a day. Bottle A maintains its bulk, although continually decreasing in its opium contents until bottle B is exhausted. At the end of this course a second treatment is given, beginning with about one-third the initial amount of opium used, and upon completion of this the patient should be cured. With 25 oz. in the bottle and 1½ oz. at each dose, there would be about sixteen doses in each bottle. Each dose would represent a decrease of one-sixteenth of the total amount of opium left from each succeeding dose up to the seventeenth dose on the sixth day, or until bottle B is exhausted. There would then be no further change to the thirty-second dose, when the entire 120 gr. would have been taken and the contents of the two bottles exhausted."

Silkworth has had some successes with this procedure, and Lebeaupin and Jeuniga[2] confirm his report both as regards opium smokers and morphinists.

References.—[1]*N. Y. Med. Jour.* May. 30, 1908 ; [2]*Wien. klin. Woch.* 1908, No. 12.

CORN OIL.

Ritter[1] recommends corn oil as a cheaper substitute for cod-liver oil, olive oil, and butter in the treatment of **Tubercle.** Corn oil is produced as a by-product of starch manufacture, and can be obtained in unlimited

quantity at a low price. As a food or tissue builder it is fully equal to cod-liver oil. It is well borne and does not cause eructations. The pure oil is light straw-coloured, with a peculiar corn flavour. Its composition is complex, mostly glycerides of fatty acids—stearic, palmitic, oleic, archidic, etc.

REFERENCE. [1] *Imp. Jour. Med. Sci.* June 18, 1908.

CREOSOTE.

In the Russo-Japanese War every Japanese soldier in Manchuria received after each meal 0·1 gram creosote as a prophylactic measure against **Cholera, Dysentery,** and **Enteric Fever.** Though the daily dose was, therefore, 0·3 gram, or about 5 gr., the drug was well borne and had an excellent effect in regulating the bowels. The administration of creosote was based upon some work of Totsuka, which showed that *Bacilli coli* cultivated from normal stools and inoculated along with *B. cholera* and *B. typhosus* on culture media had no effect upon these pathogenic organisms. If, however, before this *B. coli* was isolated, the man had been given 0·3 gram daily of creosote, the *B. coli* under these conditions flourished excessively and overgrew the other pathogenic organisms. Kasai[1] has investigated the intestinal action of creosote, and finds that whether given by the mouth or by the blood it causes energetic contraction of the upper portion of the duodenum. This was not prevented by atropine, morphia, or curare, and is probably a direct action upon the muscle.

REFERENCE. [1] *Arch. Inter. d. Pharm.* 1908, vol. xviii. Fasc. 1, 2.

DIGITALIS.

Nestor Yernaux[1] has made a long study of the action of digitalis on the rabbit heart, and comes to conclusions somewhat different from those usually held. According to him the effect of the drug upon the heart muscle is almost nil. In therapeutic dose the slowing is entirely vagal. The same holds true for the first stage of digitalis poisoning. Artificial respiration restores the original rhythm, removing the hypertension due to peripheral vascular constriction. With artificial respiration the animal survives for long periods, but, if it is ceased, dies rapidly from asphyxia. The heart of an animal killed by digitalis is still capable of action; almost all the other muscle tissue dies before the heart. Even ten to twenty minutes after death the heart, with a good artificial circulation, begins to beat again, and does so for fifteen to twenty minutes, responding to reflex stimulation. Even the addition of digitalis, representing the lethal dose, has no action on the heart. Double the lethal amount has little effect, but three times the lethal dose soon affects the heart. With the simple lethal dose no irregularity is produced in the surviving heart. Lastly he states that digitalis in intact animals rapidly disappears from the circulating blood, and cannot be demonstrated even at the commencement of poisoning.

Jonescu and Loewi[2] investigating the diuretic action in animals,

found that this occurred with small doses which do not influence the general circulation. Further, they were able to show that these diuretic doses caused dilatation of the kidney. They therefore conclude that the diuretic action of digitalis is specific on the kidney, independent of any effect on the general circulation.

Cloetta,[3] by experiments on rabbits, finds that the continuous administration of digitalis causes no anatomical alterations in the normal heart or vessels, and the functional power of these structures is not affected. With continued administration of the drug, tolerance is gradually established, but suddenly cutting it off caused no marked abstinence symptoms. In animals with aortic regurgitation artificially produced by valve puncture, the continuous administration of digitalis resulted in less marked hypertrophy of the heart than without such treatment, and at the same time the functional power was greater as measured by compressing the aorta. No secondary changes were produced in the vessels.

REFERENCES.—[1]*Arch. Inter. de Pharm.* 1908, vol. xviii. fasc. 1, 2; [2]*Archiv. f. exper. Path. u. Pharm.* June 19, 1908; [3]*Ibid.* Aug. 1908.

DUGONG OIL.

Dugong oil[1] is used in Queensland as a substitute for cod-liver oil in **Wasting diseases.** The oil is clear, of a yellowish colour, and is not objectionable in taste. It is obtained from two varieties of halicore found in the rivers and bays of Northern and Eastern Australia. The oil is obtained by boiling the superficial fat, and is described as "bland and sweet, and free from disagreeable taste and odour, so that it can be taken more freely than cod-liver oil, which it is thought to equal in virtues." [This oil appears to be a revival of an old remedy. It was sold 30 years ago in this country.—ED. M.A.]

REFERENCE.—[1]*Lancet*, Oct. 10, 1907.

ERGOT.

Kehrer[1] found the surviving uterus of the cat a suitable method for testing the activity of ergot preparations. He investigated among other things the keeping properties of ergot preparation, and comes to the conclusion that after one year the power of inducing uterine contraction is reduced to one-seventh, and after two years to one-fifteenth of the original effect. As former investigators found that the vaso-constricting effect (tested on the comb of the cock) disappeared within six months, he concludes that the vascular constriction and the uterine contraction are due to different bodies. As regards the activity of the different preparations, he found that fresh watery extracts and all the commercial ergotins examined were active, but clavin was without any action on the uterus.

Gordon Sharp,[2] on the other hand, has noted the keeping properties of liquid extract of ergot, and finds that, without any special effort to protect it from light or air, the preparation was perfectly active at the end of twelve months. He further points out that too large doses should not be used, as sometimes they cause relaxation instead of

contraction of the uterus. It has recently been shown by Dale, that in small doses ergot contracts the uterus, while in very large doses it has a relaxing effect; hence Sharp deprecates the use of such doses as half a fluid ounce, repeated within an hour. He himself uses 30 min. as a dose.

Livingston[3] believes that the indications for the use of ergot are very numerous, even apart from gynæcological and midwifery cases. It acts in all conditions where there is a relaxed condition of constricted muscle. It does not markedly contract that which is normal in tone. It acts most strongly where the atonic relaxed condition is only of recent standing. The drug acts best when given hypodermically. The following is Livingston's slight claim for ergot: "It tends to equalize vascular tension; to distribute the blood equably throughout the body; to restore or to promote functional activity of glands and organs generally, and vasomotor centres particularly; to promote sleep; to relieve pain, nervousness, and spasm; to prevent or modify the effects of autotoxins and bacteria; to promote assimilation, absorption of exudates, and elimination of waste; to relieve nausea; to prevent the ill and dangerous effects of anæsthesia; to promote the healing of wounds; to prevent or modify inflammation; to arrest capillary hæmorrhage; to relieve narcotic poisoning, and to make the work of the heart more easy, and so to prevent its exhaustion or paralysis."

References.—[1]*Arch. f. Exper. Path. u. Pharm.* Xp. 28, 1908; [2]*Pharm. Jour.* Jan. 25, 1908; [3]*Med. Rec.* Nov. 23, 1907.

ETHER.

James[1] for twenty-five years has advocated the treatment of **Sciatica** with injections of sulphuric ether in combination with morphine or cocaine. This treatment has always produced marked relief, and in the majority of cases cure. In order to define the nerve on the surface a point is taken at the junction of the middle and lower third of a line stretching from the posterior superior spine of the ilium to the outer part of the tuber ischii, and a line drawn from this to the middle of the upper part of the popliteal space. The line must be slightly curved, with its convexity outwards, and as it passes downwards to the lower border of the gluteus maximus is slightly nearer the tuber ischii than the great trochanter, as it bisects a line drawn between these two points. After local and constitutional means have failed, he begins by injecting subcutaneously æther. sulph. 5 min. and cocaine (1 12) 2 min., or morphine 3 min., once a day into the sciatic nerve with a needle 2½ in. long, after marking out the position of the nerve by measurement and touch. Unless the patient involuntarily shoots out his leg you have not touched the nerve.

Cunningham[2] claims for **Rectal Anæsthesia** with ether that the operation field in the head is left quite free, there is no coughing or increase of saliva or suffocation feeling, while the initial excitement stage fails and the patient rapidly comes out of the anæsthetic. After-effects are rare. There is no fear of pneumonia, and vomiting is very

rare. Consequently the method is useful for alcoholics and patients suffering from bronchitis or emphysema. The only disadvantages are occasional irritation of the rectum, with bleeding or constipation. During the anæsthesia the various stages cannot be controlled as readily as with the ordinary method, and occasionally severe colicky pain and distention of the rectum may set in. The technique consists in thoroughly cleansing the rectum. The ether bottle is placed in warm water just below the boiling point of the ether, and the vapour is pumped in by an elastic ball. The connecting tube should not be long enough to permit the ether to re-condense. Slight discomfort and tenesmus are often the first effect, but this soon passes off. Within five minutes the breath smells of ether. Two or three compressions of the bulb in the minute keep up the anæsthesia. If the anæsthesia becomes too deep the rectal tube is removed, and any ether is expelled by massage, and if necessary oxygen can be pumped in. By this method the pure undiluted ether passes into the blood, and there is more rapid anæsthesia and no excitement.

REFERENCES.—[1]*Brit. Med. Jour.* Oct. 10, 1908 ; [2]*Bost. Med. and Surg. Jour.* 1907, No. 11.

EUSTENIN.

This preparation is a combination of iodine and theobromine in the form of a double salt, containing respectively 51 per cent theobromine and 42·6 per cent iodine. It is a somewhat hygroscopic powder, readily soluble in water, of an alkaline reaction and rather bitter in taste. The new preparation was tried in Von Noorden's clinic, and was administered chiefly as a powder, or in capsules containing 7 or 15 gr. It is not very stable in watery solution. Jagié[1] tested the drug in arteriosclerotic, renal and cardiac disease. With 80 gr. in the day a prompt diuretic action was obtained, but in several instances marked iodism developed. In smaller amounts (30 gr. daily) he obtained good results with **Arteriosclerosis, Angina Pectoris,** and **Aortic Aneurysms.** Usually the blood-pressure was reduced, with diminution in the pain and other subjective symptoms.

REFERENCE.—[1]*Berl. klin. Woch.* 1908, No. 4, in *Ther. d. Gegenw.* June, 1908.

GELATIN.

Michaelis[1] has used hot injections of 5 per cent gelatin with success in **Intestinal Hæmorrhage.** The end of the bed is raised, and the solution is run in as slowly as possible at a temperature of from 48° to 50° C., by means of an irrigator. The quantity injected varied, but as a rule 8, 10, or 16 oz., seldom 30 oz., were used. In twelve cases of enteric fever with hæmorrhage the gelatin checked the bleeding, and in severe cases, which from other causes subsequently proved fatal, the post-mortem examination showed that the hot gelatin solution had not done any damage to the bowel.

REFERENCE.—[1]*Med. Klin.* 1908, No. 2.

GUADANIN.

This preparation has been recommended as a routine application to the nipple to prevent cracks and fissures, but Riemann's results[1] do not bear this out. He tested the preparation in a long series of cases, and found that sore nipples occurred to a larger extent with the patients so treated than in a similar series when no treatment at all was used.

REFERENCE.—[1] *Cbl. f. Gyn.* Nov. 30, 1907.

GYMNEMIC ACID.

Belletrud and Mercier[1] state that this drug applied to the tongue causes **Loss of Taste** and complete inability to recognize sweet and bitter substances. They suggest that this fact may be utilized in cases where patients have a disgust for certain articles of diet. They succeeded in producing momentary disappearance of illusions of taste by applications of a watery solution to the tongue. [Gymnemic acid is the active principle of *Gymnema sylvestris*, the Indian drug mera singi, kavali.]

REFERENCE.—[1] *Progrès Méd.* Aug. 24, 1907, in *N. Y. Med. Jour.* Sept. 27, 1907.

INTRAVENOUS MEDICATION.

Felix Mendel[1] is a strong advocate of this plan of administering drugs. Contrary to the usual belief, he states that by this method the drug remains longer in the body and is more slowly excreted than with oral administration. He claims to have demonstrated this with both sodium salicylate and sodium iodide. He also points out that with intravenous administration the full effect of a drug is obtained immediately, whereas with all other methods the drug requires to be absorbed, and as excretion also goes on, the full dose is probably never in the circulation at the one time. He thinks that this is of special moment in the treatment of infectious diseases, where it is necessary to have a certain concentration of the drug before the antiseptic action is obtained. By far the easiest way to accomplish this is to inject the drug directly into the veins. As regards the intravenous use of sodium salicylate Mendel holds that its antitoxic action is readily obtained, but that to reduce febrile manifestations the drug should be given by the mouth. The real field for intravenous injection of sodium salicylate is in the treatment of rheumatic affections, which cause no fever. In such cases the pain and articular manifestations rapidly improve. Atoxyl is a drug which can also be used for intravenous injection. He employs a sterile 1·5 per cent solution, and injects a quantity containing 0·2 to 0·3 gram of atoxyl. The intravenous use of digitalis and strophanthus preparations has been strongly advocated, but there is considerable risk with this method of application. The action is instantaneous, but if the heart is not capable of rising to the additional stimulus, it may give out either immediately or in the course of a few hours. Mendel does not think that either strophanthin or digalen is very suitable for intravenous use. He has a distinct

preference for digalone, which is a much weaker preparation obtained by dialysis of the fresh leaves. This preparation he has now used on over 2,000 occasions, with upwards of 200 patients, without any accident or alarming symptoms.

REFERENCE.—[1]*Ther. d. Gegenw.* July, 1908.

IODINE PREPARATIONS.

Iodalbin.[1]—This compound of iodine and egg albumen contains 21 per cent of iodine. It is a practically tasteless powder, insoluble in the gastric juice, but is dissolved in the alkaline intestinal juices, and is slowly absorbed. It may be administered in powders, tablets, or capsules, or in any beverage or food which is not alkaline in reaction. Gastric irritation is not produced, nor the exaggerated effects which often follow the absorption of the more soluble alkaline iodides. It is non-toxic, and may be used for the same purpose and under the same conditions as, but in somewhat smaller dose than, the alkaline iodides.

Iodine-Benzine.—Heusner[2] recommends the use of a solution of 1 part iodine in 750 benzine and 250 liquid paraffin for **Disinfection of the Hands.** The addition of the paraffin prevents irritation of the skin after removal of the fat. The mixture is explosive. In disinfecting the hands 10 oz. of the solution is allowed each person. The hands are not wet with water, but are rubbed for five minutes with a brush, and coarse cloth, whereupon the hands are smeared with vaseline containing 2 per cent iodine, and cotton gloves are used. Subsequently the stain can be removed by alcohol and sodium hyposulphite. Mercurial disinfectants cannot be used along with the iodine solution, as they form irritating bodies.

Iodalidine.—This is a new compound of iodine with albumin. Boruttac[3] has investigated its action, and finds that it is rapidly absorbed, but remains chiefly in the blood and is not deposited in the fat. Excretion is comparatively rapid, and the excretion of N is increased almost as if a thyroid preparation had been given.

Iodomenin.—Obtained from the action of albumin on bismuth iodide. This preparation is stated by Busch and Gumpert[4] to differ from the albuminous iodine preparations, both in its composition and chemical behaviour. It is tasteless, free from odour, and pleasant to take. Insoluble in acid solution, it readily dissolves in alkaline mixtures, splitting into bismuth, albumin, and an alkali iodide. Consequently the drug passes the stomach unchanged, and is only split up in the intestine. Iodine appears in the urine in about an hour. The action is mild and gentle, without any gastric irritation. For therapeutic applications iodomenin is given in $\frac{1}{2}$-gram tabloids, corresponding to 1 gr. of potassium iodide. One or two tabloids may be given thrice daily, and exert a mild protracted influence, suitable for syphilitic, arteriosclerotic, neuralgic, and asthmatic conditions.

Iodothyrin.—Fürth and Schwarz[5] state that when iodothyrin is injected directly into a vein it produces in cats an abrupt fall of blood-

pressure, apparently as the result of a direct action upon the heart. These authors were able to prepare a kind of artificial iodothyrin by the action of iodine on blood albumin, which has a similar action upon the circulation. The fall of blood-pressure after the injection of extract of thyroid gland does not depend upon the presence of iodothyrin, but seems to be a cholin action.

Iodide of Sodium. It is claimed by many writers that this drug exerts an action upon the metabolism of proteid bodies, but Sgahtzer[6] was unable to discover any constant effect upon the albumin metabolism in a series of experiments on rabbits.

REFERENCES.—[1]*Ther. Gaz.* Mar. 15, 1908; [2]*Deut. Zeit. f. Chir.* lxxxvii. 4, 1907; [3]*Deut. med. Woch.* 1907, No. 37; [4]*Ther. d. Gegenw.* Ap. 1908; [5]*Centr. f. inn. Med.* May 9, 1908; [6]*Arch. Inter. de Pharm.* 1908, vol. xviii. fasc. 3, 4.

IOTHION.

Witthauer[1] has used iothion as a means of **Sterilizing the Skin** for operations. He employs the drug as a 10 per cent alcohol solution for disinfecting the skin of the abdomen and the external genitalia as follows:—The skin is cleansed in the usual way with soap, alcohol, and corrosive sublimate, and is then dried with a sterile towel. Thereupon the skin is rubbed with a piece of gauze saturated in the iothion solution, held in a pair of forceps. The iothion solution rapidly penetrates into the skin and soon disappears. When the operation is finished, before the stitches are inserted, the edges of the wound are rubbed with ether, and then the iothion solution is again applied. He claims that the skin is not irritated by this procedure, and that at the most slight desquamation occurs without causing any discomfort. No stitch abscesses or other disturbance have been seen since this technique was adopted.

REFERENCE.—[1]*Centr. f. Gyn.* Aug. 1, 1908.

IRON.

In discussing the treatment of **Chlorosis**, Warfwinge[1] states that the only useful treatment consists in the administration of iron. This specific action is obtained both with the ordinary inorganic preparation and those inorganic ones which give the iron reaction with the ordinary reagents. On the other hand, he finds those organic preparations quite useless in which the iron is so firmly bound up that no reaction is obtained with the ordinary tests, e.g., hæmoglobin, hæmatin, hæmol, etc. To do any good in chlorosis the iron preparation, organic or inorganic, must become more or less dissociated in the blood and body fluids. He does not think that the iron is absorbed and passes into the hæmoglobin molecule, but that the iron ions in the state of dissociation act as a catalytic agent, destroying the hypothetical toxin which he holds is the cause of chlorosis. The catalytic action is probably proportional to the number of ions set free, so that he advocates large doses. It certainly does not stimulate the marrow to increased formation of erythrocytes.

Van Gieson[2] has an interesting paper on the comparative therapeutic value of the compounds of iron. He finds that the old official preparations are reliable. He prefers the ferrous carbonate, the soluble oxide with sugar, the double salts with the vegetable acids, and the perchloride of iron. He recommends the following mixture :—

℞	Ferri et Ammon. Cit. ℥v Aquæ Cinnamomi	|	Vini Angelicæ	āā ℥vij

The dose is two teaspoonfuls. For the perchloride of iron he gives as a good formula the following :—

℞	Liq. Ferri Perchlor. ℥iiiss Aq. Dest. ℥viss	|	Glycerini	℥ij

Of this from 10 to 30 minims in 10 to 30 drachms of milk make a palatable mixture which does not attack the teeth. He has obtained no better nor quicker results with the numerous organic preparations on the market.

References.—[1]*Nord. Med. Arkiv.* 1907, Abt. ii. (Innere Med.), Heft i. ; [2]*N. Y. Med. Jour.* Ap. 11, 1908.

LANOLIN.

Since it has been discovered that the cutaneous absorbability of a drug depends upon the ease with which it can go in solution into the sebum and cholesterin of the skin, it is of importance to know what is the solubility of various substances in these constituents of the skin. Klose[1] has accordingly investigated the solubility of several bodies in anhydrous lanolin, the most readily available cholesterin substance. His results are as follows : Sublimate solubility, 1·5 per cent ; mercuric nitrate, 1·1 per cent ; sulphur, 0·3 per cent ; perchloride of iron, 4 per cent ; ferrous sulphate insoluble ; lead acetate, 1 per cent ; iodine, 5·5 per cent ; iodoform, 5 per cent ; camphor, 11 per cent ; cantharidin, 4·2 per cent. Phenol is soluble, but it was impossible to determine to what extent. Potassium iodide is quite insoluble in anhydrous lanolin, but when the lanolin is hydrated with 30 per cent of water, the iodide is soluble to the extent of 42·5 per cent.

Reference.—[1]*Arch. Inter. de Pharm.* 1908, vol. xviii. fasc. 1, 2.

LECETHIN.

Peritz[1] has seen great improvement result from the use of large intramuscular injections of lecethin in **Locomotor Ataxia** and **General Paralysis of the Insane.** He considers that the lecethin combines with the luestoxin of Wasserman, and so protects the nervous tissues. He believes that in these cases the nervous system has been gradually starved of lecethin, by the combination of the "luestoxin" with lecethin, and that the symptoms probably depend upon this. By injecting lecethin a more ample supply is present, and the nervous tissues obtain a satisfactory amount of lecethin. This is put forward as a working hypothesis. The injection is 0·1 to 0·2 gram, and about

10 grams were given to each patient. In a series of nine cases the most constant improvement consisted in return of sensation and the disappearance of Romberg's symptom. In three cases the eye reflex to light returned.

REFERENCE.—[1]*Berl. klin. Woch.* Jan. 13, 1908.

MALE FERN.

Renzi[1] states that male fern is not only efficacious against **Parasites** in the intestines, but also against parasites lodged in other parts of the body, e.g., liver, brain, etc. He has used it successfully in two cases of generalized formation of cysticerci in the skin, brain, etc. Sawyer[2] points out that a recent French writer[3] stated that male fern is of use in **Tuberculosis**, especially if the tubercle affects the lungs.

REFERENCES.—[1]*Sem. Méd.* Aug. 5, 1908; [2]*Prescriber*, June, 1908; [3]*Le Petit Jour.* May 13, 1908.

MARETIN.

This compound (carbonic acid meta-tolyl-hydrazide) was introduced some time ago as a safe antipyretic. Several writers have recently pointed out that the drug is by no means safe from unpleasant side-effects. Thus Percival[1] noted jaundice in six out of thirty cases. He thinks that it has a definite hæmolytic action, and that it is by no means an ideal antipyretic. As a rule the jaundice was not severe, and only came on after a few days' use of the drug. This action on the blood seems also to have occurred in a case of Port,[2] who noted toxic symptoms in a phthisical patient who took 7 gr. of maretin twice daily for nine days. The antipyretic action was good, but a marked anæmia developed. The complexion became yellowish, and later the patient turned dyspnœic and cyanotic. The blood-count fell to 1,184,000 red corpuscles, 11b 40 per cent, and leucocytes 18,000, while nucleated red cells and polychromatophilia and poikilocytosis were seen. The patient recovered.

REFERENCES.—[1]*Rev. Crit. di Clin. Med.* 1907, viii. p. 735; [2]*Deut. Med. Woch.* Aug. 29, 1907.

MEDLAR.

Mercier[1] recommends the medlar in **Chronic Dysentery** and **Enteritis.** When ripe it contains large quantities of sugar and tannic acid. He gives half a pound of the ripe fruit (skinned and stoned) along with 2 litres of milk in the day. Medlars preserved with sugar and water are equally efficacious.

REFERENCE.—[1]*Arch. de Méd. Naval*, 1907, 1, in *Gaz. d. Hôp.* Dec. 19, 1907.

MENTHOL.

Schwenkenbecher[1] noted slight poisoning after taking 10 grams of menthol in olive oil. There was slight mental confusion, and a peculiar effect upon the skin which made all substances appear cold. The same thing was noticed in the throat and in the anal region. He considers this paræsthesia depends upon a stimulation of the sensory nerves

which appreciate cold. The cerebral disturbance passed off in half an hour, but the sensory disturbance lasted for about twenty hours. He suggests 2 grams as a maximum dose.

Marini[2] finds that small doses of menthol every half hour are the best means of allaying the **Intractable Vomiting of Cholera,** while they also relieve the diarrhœa and tenesmus. He gives a teaspoonful of menthol, 0·25 gram in 50 cc. each of anise and chloroform water and 40 drops of lactic acid. Menthol is useful in acute and chronic **Asthma,** though not so rapid in action as morphine. In **Dyspnœa** from emphysema or other lung conditions, menthol allays the dyspnœa and quiets the cough. It is also useful for checking **Vomiting** in acute dysentery and in hyperchlorhydria.

References.—[1]*Münch. med. Woch.* July, 14 1908 ; [2]*Jour. d. Prat.* May 16, 1908, in *Brit. Med. Jour.* Oct. 3, 1908.

MERCURY.

Lisin[1] has investigated the effect of intravenous and subcutaneous administration of mercury on the blood. He finds that the intravenous injection of perchloride of mercury caused at first a leucopœnia, followed by polymorphonuclear leucocytosis and eosinophilia. The subcutaneous injection of calomel produces little alteration in the blood. He concludes that mercury is without any specific action on leucocytosis.

Reference.—[1]*Arch. Inter. de Pharm.* 1908, vol. xviii. Fasc. 3, 4.

MISTLETOE.—(*See* Viscum Album.)

MORPHINE.

Friberger[1] has tested the comparative rapidity of the various methods of producing the action of morphia. Contrary to the usual belief, he finds that oral administration produces almost as rapid an action as subcutaneous injection of the same dose, using the contraction of the pupil as an indicator, but the myosis passes off much more rapidly with oral administration. As regards effect, 1 cgram subcutaneously produces as marked an action on the pupil as 3 cgrams by the mouth when the stomach is empty. If the stomach is full, absorption is slower and more feeble. Rectal administration corresponds to that produced by oral administration with the stomach empty, and it is immaterial whether the morphine is given in solution or as a suppository. He thinks that during digestion the morphine should be administered by the rectum in preference to the mouth.

The usual explanation of morphine immunity is that the tissues acquire the power of rapidly destroying or rendering the morphine inert. Rübsamen[2] shows that this explanation cannot be applied in its entirety to some animals. Thus white rats, though they apparently possess some power of destroying morphine, still allow more than the average toxic dose for untreated rats to remain unchanged. Hence the tissues may have some other unknown method of protecting them-

selves. He was not able to confirm Cloetta's statement that the brain tissues of immunized animals show an increased power of destroying or combining with morphia.

REFERENCES.—[1]*Upsala lakareförenings förhandlinger*, 1907, xii. 5, 6, in *Sem. Méd.* Jan. 8, 1908; [2]*Arch. of Exper. Path. u. Pharm.*, Aug. 24, 1908.

NUCLEINS.

Nucleic Acid.—The relation of uric acid to nucleic may be of value in relation to gout. Minkowski found that urate of soda formed with nucleinate of soda a compound from which acetic acid did not precipitate uric acid. Seo[1] has investigated the relations of these two bodies separately and combined. Under certain conditions they combine in the proportions of two molecules of uric acid with one of nucleic acid, which decomposes in the presence of albumin with liberation of free uric acid. Administration of the compound and of similar quantities of the separate substances showed that in the dog and rabbit the elimination of uric acid was less high when separate than when in combination. Further, in the dog the elimination of allantoin, a substance formed from uric acid with the compound, seems to show that the combination favours the excretion of uric acid, but does not favour the formation of allantoin from uric acid.

Nucleinate of Soda.—The subcutaneous or intravenous injection of nucleinate of soda produces in twenty-four hours a well-marked leucocytosis. It is asserted that this leucocytosis renders the peritoneum better able to resist bacterial infection. It has therefore been suggested that such injection may be used as a prophylactic measure before operative interference with the abdomen. Thus Chantemesse[2] recommends the injection of 40 cc. of physiological salt solution containing 0·40 gram of sodium nucleinate. This causes pain, which may be relieved by opium fomentations. In six to eight hours a very pronounced mononuclear leucocytosis is produced, which steadily increases for two days and persists for four or five days, and then gradually lessens. He also states that the opsonic index of the blood may be increased.

Diez and Campora[3] investigated the effect of nucleinate of soda on guinea-pigs. Intraperitoneal and subcutaneous injections caused a brief leucopœnia, followed by a leucocytosis lasting seventy-two hours. The previous injection of the drug six, twelve, eighteen, or twenty-four hours before intestinal perforation, delayed the subsequent development of peritonitis, apparently increasing the resistance of the peritoneum.

REFERENCES.—[1]*Beh. f. Exper. Path. u. Pharm.* 1907, lviii. 1, 2; [2]*Klin. Ther. Woch.* in *Ther. Gaz.* Sept. 15, 1907; [3]*Quinz. Ther.* 1907, viii. 05.

OXYGEN.

Franke[1] recommends oxygen baths in the nervous and vasomotor disturbances of the **Menopause.** The treatment has a sedative effect and lowers the abnormally high pressure found in such cases. The bath lasts for ten minutes at first, but is gradually increased up to

twenty or twenty-five minutes. The temperature of the water varies from 89·6° to 98·6°. After the bath the patient goes to bed immediately.

Leonard Hill[2] finds that oxygen inhalations produce a marked stimulant effect on people out of training or on athletes who are exhausted. Thus Flack noted the beneficial effect produced on Wolffe in his attempt to swim across the Channel. When he was apparently thoroughly done and completely disheartened, inhalation of oxygen gave him fresh vigour and enabled him to continue his swim for another hour and a quarter. Similarly, in horses not in the best of training, oxygen inhalation increases the power of work, as tested by climbing hills. On the other hand, athletes and racehorses in perfect training seem to derive no benefit from breathing oxygen. Its beneficial effect is very great, however, on the untrained or fatigued man. Hill has designed a simple apparatus—combined generator and inhaler—which enables oxygen to be as readily made as soda-water with a gazogen. The apparatus is made by Messrs. Siebe, Gorman and Co., 187, Westminster Bridge Road.

Gréhaut[3] recommends prolonged administration of oxygen in poisoning with carbon monoxide, combined, if necessary, with tongue traction and artificial respiration. Experiments on dogs gradually poisoned by inhalation of air containing 1 per cent carbon monoxide showed that it required at least one hour of oxygen administration before the CO disappeared entirely from the blood, as is shown by the following table :—

	100 cc. blood contained O	CO
Before CO administration	23·0 cc.	0 cc.
After 16 minutes inhalation of 1% CO ..	4·5	19·1
After 1 hour's inhalation of O	23·9	2·8
After 2 hours' inhalation of O	27·0	0

References.—[1]*Zeits. f. diät. u. phys. Ther.* Aug. 1908 ; [2]*Brit. Med. Jour.* Aug. 22 and Oct. 3, 1908 ; [3]*Bull. d. l'Acad. d. Méd.* 1908, No. 18.

PHENOLPHTHALEIN AND SODAPHTHALYL.

Fleig[1] has investigated the action of phenolphthalein and sodaphthalyl, and finds that they are **Reliable Purgatives.** The action is solely upon the secretions, and is not due to stimulation of peristalsis. Injected into a vein there is increased secretion from the liver and pancreas, and local application to the mucous membrane of the duodenum caused increased glandular secretion. Sodaphthalyl produces a purgative effect when injected subcutaneously. The drugs produce no effect upon general nutrition. They are only very slightly absorbed, do not irritate diseased kidneys, and according to Fleig are the purgatives indicated in **Albuminuria,** especially sodaphthalyl, which produces copious watery stools. The dose of phenolphthalein is 0·15 gram to 0·4 gram for an adult, as a tablet or cachet. Sodaphthalyl can be given in smaller doses. For subcutaneous use he recommends 0·2 to 0·3 gram as a 3 per cent solution in normal saline.

Reference.—[1]*Arch. Inter. de Pharm.* 1906, vol. xviii. Fasc. 3, 4.

PICROTOXIN.

P. Paterson[1] states that injection of picrotoxin prevents **After-vomiting from Chloroform.** He gives an injection of 1 cc. of a 0·2 per cent solution immediately the operation is completed. Children receive a small dose, using as a basis 5 min. of the solution for a child four years old. In the rare cases when vomiting develops, a second injection of half the original dose is given if the vomiting persists for over ten minutes.

REFERENCE.—[1]*Sem. Méd.* Sept. 18, 1907.

QUININE.

Jackson and Mead[1] claim excellent results with long-continued administration of quinine hydrobromide in **Exophthalmic Goitre.** It is given in capsules of 5 gr. t.i.d. Little or no benefit is got for about a month, and the treatment must be continued for two years.

Solis-Cohen[2] strongly recommends the double chloride of quinine and urea in acute and chronic **Malaria.** He finds it superior to other preparations. After a single injection of 1 gram, patients remain free from paroxysms for either six and a half days or thirteen days. The salt is readily soluble, but is apt to produce sloughing unless care is taken. Solis-Cohen finds that if it is injected deeply under the skin, not necessarily into muscle, and if care is taken to empty the syringe completely before withdrawing the needle, so that no drop of the solution falls upon the integument as the needle leaves the tissues, no slough need be feared. When the injection is made within less than two hours of the expected paroxysm, it does not prevent the occurrence of the chill, but the chill is prevented if given three or four hours beforehand. In about one-third of the cases the freedom from chills lasted between six and seven days. These cases were chiefly quotidian in type. In the remaining two-thirds the freedom lasted for thirteen days, and the preponderating number of these cases were tertian in type.

Lancereaux and Paulesco[3] recommend quinine sulphate in **Exophthalmic Goitre.** They treated twenty cases with the neutral sulphate with satisfactory results. From 15 to 23 gr. were given in cachet every evening with food, or in two doses at intervals of fifteen minutes, and this was continued for fifteen to twenty days each month. The result was rapid diminution in the vasomotor disturbance, bad dreams, tachycardia, and pupillary dilatation. The exophthalmos slowly disappears, and the goitre may also subside if not of too long standing.

REFERENCES.—[1]*Bost. Med. and Surg. Jour.* 1908, clviii. 346; [2]*Amer. Jour. Med. Sci.* Sept. 1908; [3]*Bull. de l'Acad. de Méd.* 1908, No. 8.

QUINIC ACID.

This substance was stated by Weiss to cause a marked decrease in the output of uric acid and an increased excretion of hippuric acid. The experiments of Weiss have been subjected to destructive criticism by various writers. The latest to do so are Taltavall and Gies,[1] who carried out a series of observations on a dog kept in nitro-

genous equilibrium on a constant diet. Their results are of special interest because they seem to show that quinic acid did not materially affect either the endogenous or exogenous metabolism of uric acid in an animal of a type which ordinarily excretes only trifling quantities of that substance, and, in the main, oxidizes freely purin products of both internal and external origin.

REFERENCE.—[1]*N. Y. Med. Jour.* Oct. 19, 1907.

PILLS.

The dissolution of pills in the gastro-intestinal tract has been studied by Rieben.[1] Using potassium iodide as the test substance, he found that pills made up with powdered liquorice and simple syrup broke up most readily. The excretion of the iodide was at its height in the second and third hour after ingestion. Silver-coating the pill produced distinct slowing in the absorption. Pills made up with liquorice and soap keep well, but the excretion of KI does not follow so rapidly as after the syrup pill.

REFERENCE.—[1]*Arch. f. Pharm.* Bd. ccxlv., Heft 7.

RESORCIN.

Nothen[1] publishes two cases of poisoning from the external use of resorcin. The first case was seen in a healthy man suffering from eczema of the back, who was healed with an ointment of sulphur, resorcin and oleate of zinc. The urine was green, becoming black on standing, and for a couple of days contained blood-colouring matter. This patient recovered, but the second case proved fatal. The patient was a child of eleven days, suffering from pemphigus neonatorum, who received a 3 per cent application of resorcin. The child died in a few hours with symptoms of phenol poisoning. These two cases show that caution must be used in applying resorcin in cases where the absorption is facilitated by large epithelial defects, and Nothen thinks that its use should be given up entirely in weakly individuals and young children under these conditions.

REFERENCE.—[1]*Med. Klin.* June 14, 1908, in *Brit. Med. Jour.* Oct. 3, 1908.

SAIODINE.

Abderhalden and Kautsch[1] compared the excretion of saiodine and potassium iodide. No demonstrable iodine is split off from saiodine by steapsin, gastric juice, or combined pancreatic and intestinal juice. After saiodine administration iodine appears in the urine considerably later than with potassium iodide, and lasts much longer. Thus in six days after administration of 5·8 grams, only 0·727 gram iodine (corresponding to 2·8 grams saiodine) was excreted.

Benassi[2] found saiodine a good substitute for alkaline iodides in **Syphilis.** It acts as well, or even better, and can be tolerated in larger doses. Given after a meal it caused no gastric irritation or iodism.

REFERENCES.—[1]*Münch. med. Woch.* Ap. 7, 1908 ; [2]*Gaz. deg. Osped.* Mar. 1, 1908.

SANTYL.

The salicylic acid ester of sandal-wood oil is recommended by Menier[1] as a local intranasal application in **Ozæna.** The crusts are thoroughly removed by douching, and then the santyl is painted on the nasal mucous membrane. Treatment is carried out once a week, and, according to Menier, rapidly removes the fetor and crust formation.

Reference.—[1]*Berl. klin. Woch.* Nov. 18, 1907.

SCOPOLAMINE.

In discussing the means available to render scopolamine anæsthesia more reliable, and possibly less dangerous, Kionka[1] points out: (1) That the preparation may be impure; (2) That pure preparations show slight differences in their chemical and physical properties, e.g., as regards melting-point and optical activity; (3) That old solutions may undergo alteration both physical and chemical. The preparation, if impure, may be contaminated with apoatropine, an optically inactive alkaloid which, as Kobert shows, produces convulsions. Apoatropine can readily be excluded by a simple chemical test. Scopolamine in weak watery solutions produces no change when a drop of potassium permanganate solution is added. Almost all other alkaloids (except atropine and cocaine) under the same conditions cause a brown discoloration. This is well marked with apoatropine, so that the presence of 1 part in 20,000 of water gives a brown precipitate on adding a drop of potassium permanganate solution. The reaction takes place equally well in the presence of scopolamine. By this simple test apoatropine can be easily excluded. Though scopolamine undergoes some alteration when kept long in solution, e.g., diminution in optical activity, it does not seem to alter in its physiological action; still in practice only fresh solutions which are not turbid and show no sediment should be employed. In the course of his investigations Kionka found that, using the same preparation, animals showed considerable variation in the action produced, apparently as the result of individual susceptibility. He therefore recommends that in using the drug clinically a pure solution of scopolamine should be used without any addition of morphine, which can be given separately. In this way it will be much easier to control the individual susceptibility. On no account should old solutions containing morphine and scopolamine be used, as morphine gives the same reaction as apoatropine, so that the permanganate test is useless in such compound solutions. Finally, he recommends that in future only optically-inactive scopolamine should be used.

Reference.—[1]*Ther. d. Gegenw.* Jan. 1908.

SILICATE OF SODIUM.

Zickgraf[1] publishes an article on the effect of sodium silicate in **Pulmonary Tuberculosis.** The drug was administered in the form of the natural mineral water of Glashagen, in Mecklenburg, a weak alkaline water containing, in 100 grams, 4 mgrams of metasilicate of sodium.

He used this in a number of cases, and controlled the blood according to Arneth's method. He found that the number of leucocytes in the peripheral blood fell, while the proportion of multinuclears increased, which, according to Arneth's theory, means that the blood is more resistant and better able to deal with infectious agents. Simultaneously the patients gained in weight and improved in general condition. The theoretical basis for using silicates in such conditions is the statement that silicates are contained largely in connective tissue, and it is suggested that if there is a plentiful supply of silicates the pulmonary connective tissue becomes better nourished and more able to limit tuberculous disease.

REFERENCE.—[1]*Centr. f. inn. Med.* May 16, 1908.

SPIROSAL.

This substance, the monoglycol ester of salicylic acid (C_6H_4 —O—CH_2—CH_2—OH) has recently been warmly recommended as an improvement on mesotan and other salicyl preparations for local applications. It is a thick fluid, without odour or colour, soluble in alcohol. As Impens has pointed out, the drug is soluble in oils to the extent of about 17·9 per cent, or 20 per cent if mixed with equal parts of rectified spirits. This solubility in oil enables it to penetrate the skin readily, while at the same time it is, of all the salicyl esters, the one which is most soluble in water; hence it not only penetrates the skin readily, but also is able to pass quickly into the blood and lymph. This is borne out by the evidence of Gardemin,[1] who found that the urine gave the salicyl reaction within two and a half hours of applying the drug to the skin. Other observers obtained the reaction in three hours, and Perl[2] states that the reaction persists for ten to thirteen hours. Perl, Schönheim,[3] Ruhemann,[4] and Dengel,[5] all agree that the drug is not irritating to the skin, or followed by gastric irritation or ringing in the ears. Gardemin, out of fifteen cases, only noted two instances of cutaneous irritation with reddening of the skin and slight pain. Ruhemann, in one case, after the energetic application of several drachms, observed transient giddiness. The therapeutic effect of the drug is very marked in acute muscular **Rheumatism** and in the acute exacerbations of chronic joint rheumatism, while it also proved useful in acute rheumatism and in **Gout.** The most suitable formula is a mixture of equal parts of spirosal and rectified spirit, which can be thoroughly rubbed in and then covered with flannel, cotton wool, or other material to keep the part warm, and so facilitate the absorption of the drug. Frankenburger[6] found spirosal satisfactory in the **Joint Pains of Tabes.** He uses it diluted with two or three parts of spirit, which may be rubbed in or painted on, and covered with an impervious dressing.

REFERENCES.—[1]*Deut. med. Woch.* 1907, No. 69; [2]*Med. Klin.* 1908, No. 15; [3]*Budapesti Orvosi Ujsag*, 1907, No. 27; [4]*Berl. klin. Woch.* 1908, No. 23; [5]*Allg. Med. Centr. Ztg.* 1908, No. 18; [6]*Berl. klin. Woch.* May 25, 1908.

SUBLAMIN.

Tickel[1] states that Schering's sublamin is less toxic than sublimate, while it is equally powerful as a disinfectant and does not corrode instruments. Personally he prefers sublamin to sublimate, as the latter produces a painful mercurial rash which does not appear with sublamin.

Reference.—[1]*Therap.* June, 1908.

SULPHUR, COLLOIDAL.

Max Joseph[1] has used a preparation of colloidal sulphur in skin diseases, and finds it very useful. Colloidal sulphur is a greyish-white powder which dissolves in water, forming a milk-white fluid. It is best prepared with cold water, and should be freshly made. The sulphur is insoluble in alcohol, ether, and acetone, but can be made into good ointments or soaps with fats, lanoline, vaseline, lard, etc. The colloidal preparation can be used in all cases in which sulphur was formerly used. He recommends especially a 10 per cent solution in water and ointments and suspensions. It is indicated in **Seborrhœic Conditions.** For slight seborrhoides of the face, daily applications of 2 to 5 per cent watery solutions are recommended, gradually increased to 10 per cent. For cases of indurated **Acne** of the face he used an ointment containing 10 per cent made up with Lassar's paste.

Reference.—[1]*Dermat. Centb.* Sept. 1907, in *Brit. Jour. Derm.* May, 1908.

THEOLACTIN.

This preparation is a double salt of theobromine and sodium lactate. It is an extremely hygroscopic powder containing about 57% per cent of theobromine. In his original report Krüger evidently was working with an impure body, and noted that though the preparation was strongly diuretic in action, it was often followed by unpleasant side actions upon the gastro-intestinal tract, especially in the stomach. Thus vomiting and lack of appetite were not uncommon, and in a few cases diarrhœa was produced. Recently, he has again had an opportunity of testing a purer preparation of theolactin, and finds that while the diuretic action remains unimpaired, the unpleasant effects are conspicuous by their absence. His experiences show that the new preparation is a powerful **Diuretic,** which has no deleterious effect upon the heart. The taste is very bitter, and is best concealed with peppermint water. If the patient is unable to take it by the mouth, theolactin may be administered by the rectum in the form of an enema. It seems that in some cases when the drug is apparently losing its effect, either from tolerance or other cause, the simultaneous exhibition of stimulants intensifies the diuretic action. No continuance of diuresis is apparent after stopping the drug. The diuretic dose is 3 to 6 grams daily. In solution the drug does not keep too well and readily deposits a white precipitate.

Reference.—[1]*Centb. f. inn. Med.* Jan. 4, 1908.

THIOSINAMINE.

Crofton[1] records a case in which the use of hypodermic injections of thiosinamine was followed by the clearing up of a diffuse fibrosis of the lung as the result of pneumonia. Michael[2] reports two cases of widespread perigastric adhesions treated in the Ewald clinic which were greatly improved by the use of thiosinamine combined with dietetic and massage treatment. An unpleasant result of thiosinamine administration is noted by Billaud,[3] who refers to a case of chronic gonorrhœal ankylosis in which the thiosinamine injections produced an unpleasant sulphur taste in the mouth. The local condition of the joints improved as far as movement and pain were concerned, but the patient complained of lack of muscular control, apparently from deficient muscular tonus. Grosse[4] reports a case of serious poisoning in a man of fifty-four receiving thiosinamine injections for pain and stiffness in the shoulder. The first five injections caused slight pain, but the sixth was followed by violent vomiting, retching, and great prostration. Vomiting persisted for three days, with weak pulse and fever. In the first thirty hours there was complete anuria. Convalescence was very slow, and four weeks elapsed before the patient could resume his ordinary work.

REFERENCES.—[1]*Brit. Med. Jour.* Nov. 2, 1907 ; [2]*Berl. klin. Woch.* Dec. 16, 1907 ; [3]*Sem. Méd.* Jan. 1, 1908 ; [4]*Münch. med. Woch.* Ap. 28, 1908.

THYMOL CAMPHOR.

By combining 300 grams of camphor with 160 grams of thymol, a clear liquid is obtained, insoluble in water, but soluble in oils, alcohol, chloroform, and ether. It turns yellow when exposed to light, but does not decompose. Risacher[1] has used the combination for over nine years, and recommends it in the treatment of **Fungous Tuberculous Growths.** He uses it when there are large granulations, e.g., in a cold abscess, bone disease, breaking down gumma, etc., as he finds that in such cases it has the effect of dissolving the fungous granulation tissue, transforming it into a pasty liquid, which can be evacuated three to six days after the camphor thymol is injected. The abscess, etc., is aspirated, and about 2 to 4 cc. of camphor thymol are injected, part of which is allowed to escape. A second aspiration is performed in a few days, and then the wound is sealed with gauze and collodion. No sinus is left, and the wound heals rapidly.

REFERENCE.—[1]*Jour. de Méd. de Paris*, in *N. Y. Med. Jour.* Sept. 28, 1907.

TRIOXYCHLOROMETHYL VANADIUM.

This is recommended by Dermoz[1] for **Intra-uterine Injections.** He uses a 2 per cent aqueous solution, and claims that this gives the same action as hydrogen peroxide, with this important difference, that the action is indefinitely prolonged, as vanadium continually produces new oxygen. He has found it quite harmless. It often causes a slight burning at first, but this soon passes off.

REFERENCE.—[1]*Gaz. d. Hôp.* Nov. 16, 1907.

TURPENTINE.

Eustace Smith[1] considers that this old remedy is falling into unmerited disuse. The chief objections to it seem to be the taste and the fear of irritating the kidney. To conceal the taste it can be given in capsules, or for small doses in an emulsion with mistura amygdalæ well sweetened and flavoured with oil of cloves. Small doses of 5 to 10 min. have little tendency to produce irritation of the kidney, and in large aperient dose (2 dr. to ½ oz. and upwards) the action is upon the bowel, and little is absorbed. He thinks that oil of turpentine is valuable in **Purpura Hæmorrhagica**; and he treats the disease in well-nourished, full-blooded children with purgatives, using for a child of five or six years of age 2 dr. each of oil of turpentine and castor oil. For children of ten to twelve, as much as ½ oz. of these two oils may be administered. Turpentine is not a violent purgative. To get a good hæmostatic effect in purpura, small doses of 5 to 10 min. do little good, but in purgative doses it is almost a specific. Similarly in **Hæmophilia** a brisk terebinthinate aperient will sometimes bring about a cessation of bleeding. In small doses turpentine is a valuable antiseptic and sedative in **Flatulent Colic** and unhealthy states of the mucous membrane. In **Abdominal Cramp** of children 3 or 4 min. of the oil, with double that amount of castor oil can be given thrice daily. For **Thread Worms** an enema of ½ oz. of turpentine with 10 oz. of barley-water is a useful vermicide.

REFERENCE. [1] *Brit. Med. Jour.* May. 23, 1908.

UROTROPIN.

Crowe[1] publishes some observations which may prove of considerable therapeutic value, as they indicate that urotropin, in addition to its action upon the kidney, also acts similarly on the **Pancreas** and **Gall-bladder.** In the dog, urotropin is excreted in the pancreatic juice and bile, either unchanged or as formaldehyde. The excretion into the bile is both by the gall-bladder and the hepatic cells. The drug is rapidly absorbed, and the maximum concentration in the blood is obtained in five to eight hours. Excretion is prolonged over twenty-four hours at least. In human beings with biliary fistulæ similar results were got. The quantity present in the bile is considerable so that when 75 gr. are given in the day a marked bactericidal action is obtained. He recommends this dose if a rapid action is desired, but probably smaller doses will prove equally serviceable if kept up over a longer period. Thus in a distended gall-bladder infected with *B. typhosus*, the daily administration of 15 gr. gave sterile cultures at the end of ten days. In another case a massive dose of 75 gr. in the day gave a sterile growth within twenty-four hours. This is of importance when we consider how difficult it is to deal with "typhoid-carriers." Crowe also finds that the drug is excreted in the cerebro-spinal and synovial fluid, and he has successfully treated **Gonorrhœal Arthritis** of the knee by daily administration of 80 grs.

Mallannah[2] makes the curious claim for urotropin that it is a specific

for **Night Blindness.** He considers that night blindness is due to torpor retinæ from diminished alkalinity of the blood, which he thinks can be cured by urotropin.

REFERENCES.—[1]*Johns Hop. Hosp. Bull.* Ap. 1908; [2]*Brit. Med. Jour.* Feb. 22, 1908.

VISCUM ALBUM.

Gaultier[1] warmly recommends a watery extract of mistletoe as a safe means of reducing **Arterial Tension.** Experiments on dogs show that the blood-pressure is markedly reduced, while at the same time the heart beats somewhat faster. Large doses paralyze the heart and cause hæmorrhages in the gastro-intestinal tract and into the endocardium. In man the same effects are seen. Gaultier has used the drug with success in congestive hæmorrhages from the lung and uterus. In many cases it acted well after other drugs (ergot, calcium chloride, etc.), had failed. For arterial hypertension the drug has the advantage of acting for a long period. Thus in one case of anginous attacks with a pressure of 31, the administration of mistletoe reduced the pressure to 22, and maintained its action for two days after being stopped.

The best preparation to use is an aqueous extract, either as a pill or syrup. One pound of the dried leaves and young twigs are cut up and pounded in a mortar. They are then boiled with twelve pints of water for two hours, and this fluid is set aside and the extraction completed with two other portions of water used similarly. The liquids obtained are mixed and evaporated over a water bath till they reach the consistence of a syrup. Evaporation is then completed over sulphuric acid till a soft extract is formed. This may be made into pills containing $\frac{1}{3}$ gr. of the extract. The dose is 10 to 15 gr. in the twenty-four hours. A syrup may be made by dissolving one part of the extract in ten parts water and 990 syrup. The dose is fifteen tablespoonfuls in the twenty-four hours. For hypodermic use the following formula is useful: Ten grams of the dried leaves are pounded in a mortar and roughly powdered. They are then boiled for two hours with 66 cc. of water, and this extraction is repeated with two other lots of water. The three fluids are mixed, filtered, and evaporated till the product is about 50 cc., when 0·35 gram of salt is dissolved in it and the solution is filtered and sterilized for twenty minutes at 120° C. The dose is 0·5 cc., injected twice daily.

Fedeli[2] has used the extract of mistletoe in **Renal Cases** with a fair measure of success. It acts best where there is a certain degree of arterial spasm and heightened tension.

Oliveau[3] recommends the extract of mistletoe in the **Hypertension** and **Albuminuria** of **Pregnancy.**

Fraeli[4] speaks highly of its value in the **Albuminuria of Renal Disease.** It reduces the amount of albumin and lowers blood-pressure. The action is most markedly beneficial where the blood-pressure is high.

REFERENCES.—[1]*Gaz. d. Hôp.* Oct. 17, 1907; [2]*N. Y. Med. Jour.* June 6, 1908; [3]*Quinz. Thérap.* 1908, ix. 53; [4]*Rif. Med.* Ap. 6, 1908.

YOHIMBINE.

Gunn[1] finds that small doses of yohimbine act as a respiratory stimulant for frogs and rabbits. This is shown either by increased rate or amplitude, or in both rate and amplitude, of the respiratory movements. It is brought about by doses which have very slight effect, if any, upon the other systems. With these small doses the stimulation of the respiration is not followed by any depression.

Daels[2] has investigated the effect of yohimbine in producing symptoms of heat in dogs. His experiments are negative. No specific effect in producing heat was seen. The drug produces a hyperæmic condition of the genitalia, and thereby may cause the symptoms of heat to appear earlier or last longer than normal. Except in the cases when the lack of such congestion of the genitalia is the reason for the non-appearance of the "heat," the drug is unable to originate heat. It is not a drug which can produce ripening of Graafian follicles and heat symptoms.

References.—[1]*Arch. Inter. de Pharm.* 1908, vol. xviii. Fasc. 1, 2; [2]*Berl. klin. Woch.* Oct. 27, 1907.

SERUM THERAPEUTICS.

Antigonococcic Serum. Uhle and MacKinney[1] have tried antigonococcic serum (made by Parke, Davis & Co., according to Torrey's method) in a series of twenty-three patients treated partly as in-patients and partly as outdoor ambulant cases. The results were not encouraging. The serum had no effect upon the urethral discharge. Gonorrhœal prostatitis was not cured, but out of seven cases of epididymitis three improved, though it was not certain that this improvement was due to the serum alone. The best results were obtained in gonorrhœal arthritis, which in three cases was promptly relieved, while all local evidence of inflammation had disappeared in less than two weeks.

Herbst[2] comes to almost similar conclusions. The serum has absolutely no effect upon the acute gonorrhœal infections of the urinary tract or other part of the body, but he finds it unquestionably valuable in the treatment of gonorrhœal arthritis. Like most other observers, he found that a reaction followed almost every injection, sometimes in the form of a slight urticaria, occasionally with dermatitis, adenitis, and slight fever.

Perez-Miro[3] reports a series of six cases of gonococcic arthritis treated with antigonococcic serum with fair success. On the day following the first injection, the urethral discharge materially increases, and takes on a pronounced blennorrhagic character. This effect is not seen with subsequent injections, and the discharge gradually disappears. The action of the serum is marked in relieving inflammatory conditions of the articulations and testicles and in alleviating general conditions of pain. In these cases the action is more prompt and effective

than with other methods of treatment. The injection is free from pain, and only produced a reaction in two cases.

Antistreptococcic Serum.—In the treatment of streptococcic infection in man, the ordinary commercial antistreptococcic sera are uncertain in their action. On the other hand, in experimental streptococcic disease of the lower animals (horse, rabbits, mice), these same sera prove highly effectual both in a prophylactic and therapeutic sense. Zangemeister[4] suggested that the reason of the different effects in human patients may possibly be due to the fact that the amboceptor elements in the antistreptococcic serum cannot combine with the complement present in the blood of the patient, though it can do so with the mouse or horse complement. To test this, he carried out a series of experiments on monkeys, and found that the ordinary commercial antistreptococcic sera have practically no action in streptococcic infections. On the other hand, a serum obtained by treatment of an ape with non-lethal doses of streptococci, possessed marked therapeutic action in experimental streptococcic infection of other apes, though it seemed to have no effect on similar infections in mice. In view of this fact, he suggests that it would be advisable to test antistreptococcic sera for human use, on apes rather than on mice and rabbits. It is quite possible that the amboceptor cannot combine with the complement of animals on a different scale of development. If this is true, obviously we should select as our test animal one which corresponds most closely to the human being.

Meyer and Ruppel[5] have prepared a new antistreptococcic serum which is obtainable from Meister Lucius and Brüning. In preparing it they use material obtained directly from human streptococcic infections, which is grown on sterile, defibrinated human blood, without the addition of any other nutrient medium. They claim that in this way all the properties of the streptococci are maintained unchanged. Animal passage alters the properties of streptococci materially. Thus avirulent strains can by persistent animal passage be converted into virulent forms. The eventual virulent strain is the same whatever the source of the original avirulent streptococcus. Similarly, strains originally virulent can readily, by animal passage, be intensified and maintained at as virulent a level as the avirulent strain after animal passage. The new serum is prepared by the use of originally avirulent strains intensified by animal passage and also of original virulent strains.

Coley's Fluid.—Coley[6] sums up the results obtained by himself and others with mixed toxins of erysipelas and *Bacillus prodigiosus* in cases of **Sarcoma.** He refers to forty-seven personal observations and over a hundred cases treated by other people, in which the use of the mixed toxins has been followed by complete disappearance of the tumour. In twenty-eight of his own and thirty of the other cases a definite cure has been obtained, i.e., no recurrence for upwards of three years. Coley's series of twenty-eight cases includes every variety of sarcoma except the melanotic, and cures were obtained with tumours of all

parts of the body. Sarcomas alone can be cured. Carcinomatous tumours may be inhibited for a time but do not disappear completely. He considers that the treatment is now past its trial stage and should be used (1) In inoperable cases of sarcoma; (2) In cases involving a long bone where removal means loss of a limb; and (3) After operation, as a prophylactic measure against recurrence. As regards inoperable cases, the fluid should be used in all cases, whatever the character or situation of the tumour, as affording the best, and generally the only, hope of a cure. As regards the bone cases, Coley differentiates two types: (1) Where the disease is already so far advanced that a delay of even three or four weeks will probably make operative interference impossible; and (2) Where the sacrifice of the limb can be delayed for this period without serious risk. In the first class it is better not to delay the operation, but in the second, constituting the vast majority of cases involving long bones, the best plan is to give the fluid a trial for a period of three weeks. This will usually prove sufficient to find out if the toxins are likely to be successful. Should the tumour continue to grow, the treatment should not be prolonged above a week or ten days. In such case operate immediately and then, as soon as practicable, commence the use of the toxins as a prophylactic measure against recurrence. It has been found that the number of recurrences has been surprisingly small where this plan has been adopted. There is no case so desperate that the fluid cannot be used. There is little risk of doing harm. He recommends the preparation of Parke, Davis & Co., which keeps fairly well if placed on ice. It is best not to use a preparation more than a few weeks old. In the actual treatment, commence with a very small dose—not more than ¼ min. The first few injections should be made into sound tissue at a distance from the tumour. This dose is gradually increased by a quarter or a half minim till a reaction is obtained. This should be fairly severe, with a rise of temperature to 100° or 104°, with or without a rigor. The more vascular the tumour the more severe is the reaction: hence use very small doses in vascular cases. As a rule a well-marked reaction will be obtained before the dose of 12 min. is reached. It is usually quite safe to inject directly into the tumour after a few days' treatment, in doses of one quarter to one half that required to produce the reaction from sound tissue. The injections should be given daily if possible, but are not to be repeated till the temperature produced by the previous dose has fallen almost to normal. The first signs of improvement are decrease in size, marked increase in mobility, and diminution in vascularity. Hard, bony, cartilaginous tumours tend to become softer. Improvement may occur within a few days, and unless it is evident within four weeks there is no gain in prolonging the treatment. In successful cases the average treatment has lasted from two to four months. When using small doses of toxin, i.e., below 2 min., it is well to dilute it to ensure accuracy.

Larrabee[7] has used this treatment in four cases. He was struck

with the analogy between sarcomata and leukæmia. Both show marked hyperplasia of tissue, and certain cells acquire the power of unlimited growth, and metastases are formed, but the two diseases differ in that the leukæmic cells remain typical marrow elements, and the leukæmic tissue does not invade and destroy adjacent structures. Further, leukæmia is certainly influenced by intercurrent disease. The results obtained with the toxins were not unsatisfactory. One case of mixed leukæmia improved so much that it amounts to symptomatic recovery, and this has persisted for four months. Another case showed marked temporary improvement. The other two were not so satisfactory. One case of acute lymphatic leukæmia was not benefited at all, while the fourth case only showed an improvement in weight and general condition. The treatment was much more painful and dangerous than the X-ray, but in the first successful case the toxin acted when the X rays had failed. One advantage of the toxins is that they can be used by anybody who has a hypodermic syringe.

Diphtheritic Serum.—Darier,[8] using empirically strong diphtheria antitoxin, found that it had a marked effect in ocular diseases, not necessarily diphtheritic in origin. In purulent inflammations, after three or four injections of 10 cc., pain disappears and nebulæ clear up. He suggests that, in addition to its specific action, a strong antitoxin prepared with a very virulent germ may have some beneficial action upon an infective process produced by another kind of less virulent germ. Antidiphtheritic serum has been employed by Mongour[9] in various infective processes with good results. Thus he used it in a series of fifteen patients suffering from enteric fever, scarlatina, septicæmia, cholecystitis, etc. The relation between the serum and the effect produced was less striking than in the case of diphtheria, yet both local and general symptoms rapidly and markedly improved, so that he has no doubt that the improvement depended on the serum. How the serum acts is doubtful. It is suggested that perhaps the hyperleucocytosis induced augments the resistance power of the patient.

Dysentery.—Kolle, Heller, and De Mestral[10] have investigated the action of antidysenteric serum against the soluble toxin produced by the bacilli and the endotoxins contained in the bacillary bodies. They were able to demonstrate three types of toxin: (1) A bouillon toxin obtained by filtering a twenty-days' bouillon culture; (2) An aggressive toxin obtained by extracting an agar culture for forty-eight hours with distilled water; (3) A toxin obtained by washing an agar culture for fifteen minutes with physiological salt solution. Using white mice and injecting a mixture of toxin and antitoxin they discovered that in human and animal dysentery the disease symptoms are produced by the soluble toxins, which are quite distinct in their action from the endotoxins. Consequently, an antidysenteric serum should be prepared against the soluble toxin. The content of antibodies for the endotoxins in antidysenteric serum is of no great practical value.

Dopter[11] has succeeded in immunizing mice by feeding them with living or killed bacilli (Shiga's type). One single ingestion is not sufficient to establish immunity. At least three doses are required with a strong vaccine, and with a weak vaccine the dose requires to be repeated daily for a week. There is at first a negative phase, and immunity is not complete till about the end of twelve days, but then lasts for about a month.

Talaschescu and Marinescu[12] used a serum prepared by Cantacuzino in a series of ten cases of dysentery produced by infection with Shiga's bacillus. The results were very satisfactory: rapid cure was obtained in all the cases. As a rule a single injection sufficed, but in severe or chronic cases two or three were required.

Enteric Fever. Vaughan[13] thinks that it is extremely unlikely that any antitoxin comparable to that of diphtheria will ever be obtained. The typhoid germ invades the blood, but does not seem to produce a soluble toxin. We have thus an infection with a living, multiplying cell, which becomes poisonous when by autolysis or other cause its endotoxin is liberated. Vaughan prefers to designate the endotoxin a proteid poison. Like other true proteids it can be split up by chemical means into two parts—a poisonous portion containing an aromatic radicle, and a non-poisonous part or residue. The splitting up thus obtained probably corresponds fairly closely with what takes place in the body by the means of zymogen action. The poisons produced from splitting up any true proteid have similar actions, and produce almost identical symptoms. There is first a stage of cutaneous irritation, followed by paresis, which ends in respiratory failure with convulsions. Injections of the poison produce a slight degree of immunity to living typhoid germs, but the immunity is not specific, as it holds good also for colon bacilli, and can be equally produced by injecting the poison split off from egg albumen. The specific part of the bacillary body consists in the non-poisonous portion, or residue. It forms about two-thirds of the bacillary bodies, but contains much inert material. It is therefore extracted in a Soxhlet apparatus to get rid of alkali, and shaken up with a 0·5 per cent solution of carbolic acid. Filtered through porcelain, a fluid is obtained which keeps well and apparently retains its activity for years. The residue is strictly specific, and immunizes animals only against the original germs. A single intraperitoneal injection of 10 to 50 mgrams typhoid residue protects a guinea-pig against twice the minimum fatal dose of living typhoid germs given any time between the second and fifteenth days after the injection of the residue. Frequent treatment with the residue gives a more complete and lasting immunity against living typhoid germs.

On the other hand, if an animal is treated with a single injection of 50 mgrams residue, and the living germs are administered within half an hour, the animal is more susceptible, and succumbs to less than the lethal dose for untreated animals. A single small dose, not more than 12·5 mgrams, protects the animal against six times the minimum

lethal dose injected within the next thirty minutes. To explain this peculiarity, Vaughan suggests that the residue of the typhoid bacillus sensitizes the animal by developing a specific proteolytic ferment, which is stored up in certain cells in the animal body as a zymogen. When subsequently the living germs are injected, this zymogen is activated, and the bacillary bodies are broken up before they have time to multiply and produce a fatal dose of the poison. On the other hand, when the living typhoid bacillus is injected into an animal sensitized by residue, it will quickly die if enough bacilli are injected to produce a fatal dose of poison when they are split up by the zymogen. In ordinary parlance, a fatal injection of living germs does not really mean that the animal succumbs to the number of germs introduced, but to the number which they reach by multiplication during the latent period before death. In man this period of incubation lasts about ten days, and Vaughan thinks that the sickness commences when the animal body becomes sensitized and commences to split up the bacilli. Sensitization probably does not occur till some of the bacilli by autolysis or phagocytosis liberate the soluble residue which actuates the zymogen. To explain why small doses of residue given within half an hour of an injection of living germs prove more protective than large quantities of residue similarly administered, Vaughan suggests that in the latter case the residue not only liberates the zymogen, but also combines with it, thereby protecting the living germs from the proteolytic action of the zymogen. With smaller doses of residue, the zymogen is also liberated, but not all the zymogen can combine with the soluble residue introduced; hence some zymogen combines with the bacterial bodies, and thereby destroys them.

With regard to the use of the residue in human typhoid fever, Vaughan points out that it would probably be of use as a temporary protective measure. In the very early stages it might abort the disease if given in small doses of not more than 50 mgrams. The treatment of well-developed typhoid fever is quite a different problem. Here one of the great dangers is the sudden liberation of the poisonous group in sufficient quantity to overwhelm the nervous system. Larger doses of the residue, by combining with the specific proteolytic ferment, may retard the cleavage of the bacillus, diminish the quantity of poison set free in a given time, and save the life of the patient, though probably only by prolonging the disease.

Richardson[11] summarizes his experiences obtained in the serum-therapy of 130 patients suffering from enteric fever: (1) Specific therapy, confined to the original disease, seems to increase the tendency to relapse. (2) By inoculation with Vaughan's non-toxic residue, continued into convalescence, this tendency can be largely eliminated. If relapses can be prevented, then it almost certainly follows that mild enteric infections can be aborted. (3) To get the best results patients must be seen as early as possible in the infection, but (4) an early diagnosis is often impossible, and consequently specific therapy is

heavily handicapped. (5) Antityphoid serum is no more effective than filtrates and residues, and is much more expensive. (6) Typhoid filtrates may exert a powerful effect upon the course of the disease, their use being followed in many instances by chills, or rise in temperature, pulse, and respiration, and a general improvement in condition. The nature of these reactions is unknown, but possibly further study, especially of the opsonic index, in connection with these reactions may throw light upon the subject. (7) The non-toxic residue of the typhoid bacillus, as prepared by Vaughan, seems to lengthen the typhoid process, but to render it milder, and is apparently very effective in preventing relapses.

Epidemic Cerebrospinal Meningitis.—Dunn,[15] using Flexner's antiserum, has had encouraging results. Of fifteen cases treated, eight have recovered, five were convalescent, and two died. All the cases treated in the first week of illness recovered: hence the importance of early diagnosis and treatment. The serum is injected directly into the spinal canal. As much cerebrospinal fluid is allowed to escape as will come, and then not more than 7½ dr. of the serum are injected, if necessary every third day. To avoid increasing the cerebrospinal pressure, it is necessary to withdraw at least as much fluid as is injected.

Lactic Acid.—In the past year considerable interest has been taken in the effect of lactic acid bacilli. Metchnikoff has stimulated the interest by his statements regarding bacterial antagonism. He points out that the intestine contains many organisms, some of which play a useful part in digestion, while others apparently are useless. Thus putrefactive organisms in the large intestine lead to the production of certain toxins—skatol, indol, etc.,—which according to his view impair vitality and shorten life. These organisms flourish in an alkaline medium, and he suggests that it would prove of advantage to the human host if the development of such organisms was hindered by changing the normal alkaline reaction into an acid one. As a convenient method of achieving this object, he suggests the use of lactic acid bacilli, which are non-pathogenic and can readily be acclimatized in the intestine. When this is accomplished the bacilli flourish and produce lactic acid. As a result, the intestinal contents become acid, and the putrefactive organisms are prevented from growing. He claims that the lactic acid bacilli can be demonstrated in the fæces after being fed by the mouth. From investigations on many strains of bacilli producing lactic acid, he concludes that the most suitable strain to employ was the *Bacillus bulgaricus* which is used in producing the Bulgarian soured milk known as *yoghourt*. A pure culture of *B. bulgaricus* is put upon the market under the name lactobacillin. In England a similar preparation has been extensively advertised under the name of sauerin.

Leva[16] has tested on himself the effect of lactic acid cultures on *intestinal putrefaction*, and finds that the urinary excretion of ethereal sulphates was little affected, but the volatile fatty acids the aromatic oxy acids, and phenol and indican are all reduced, indicating a marked

reduction in the urine of intestinal products of decomposition. Further, he found it easy to demonstrate that the *B. bulgaricus* obtained a footing in the intestine, as in about six days after using lactobacillin it could readily be cultivated from the fæces. The clinical test on a series of thirty cases of different intestinal conditions was hardly so satisfactory as the enthusiastic reports of French observers. In constipation a brilliant result was sometimes obtained, but in other cases no distinct benefit was seen. In chronic diarrhœa the same varying result was obtained. In troubles arising from intestinal fermentation the results were not constant, but in all cases of badly nourished individuals the appearance improved and the weight increased.

Lactic Acid Bacilli in Nose and Throat Work.—Curtis[17] writes most enthusiastically of the advantage of local applications in these conditions. He considers that their use constitutes a very valuable advance in the treatment of pathogenic conditions of the nose and accessory cavities. It has proved useful in profusely discharging frontal sinus cases, in chronic ethmoiditis, and in early stages of atrophic rhinitis. He knows no topical application at all comparable with the efficacy of the lactobacilli culture in the treatment of mucopurulent secretion from the nose. The method of application has been as follows: In the nasal cavity a cubic centimetre of the culture broth has been sprayed under pressure on either side of the middle turbinate, in order to reach the anterior and posterior cell orifices, the theory being that the bacilli will find their way into the ethmoid cells and the accessory cavities, and by their secretion destroy the pyogenic bacilli which are causing the disease. A sterilized narrow test tube into which has been poured a cubic centimetre of the culture admits a sterile Sass spray tube and makes the application of the medium by compressed air pressure very convenient. In the sphenoid, frontal, and maxillary sinuses the culture may be syringed through the metal catheters appropriate to the locality. The nose is cleansed by sterile water or a mild saline solution, no antiseptic being employed. If a sinus is injected, or the meatus sprayed, the patient is directed not to blow the nose for an hour or two, and to employ nothing as a spray or douche until the following day, when a mild saline solution may be employed, if imperative, for cleansing purposes. The cases now under observation are treated every second or third day.

Lactic Acid Bacilli in Pyorrhœa Alveolaris.—Inflammation of the gums and pyorrhœa alveolaris are extremely resistant to most forms of treatment. Rosenthal and Berthelot[18] made use of pure cultures of lactic acid bacillus, and claim that the results obtained were very good. To enable the lactic acid bacillus to establish itself, massive doses are required. Their procedure was as follows: An organism obtained from a *yoghourt* of Bulgarian origin was grown upon a lactose bouillon of kidney beans. After incubating for forty-eight hours at blood heat, the culture was centrifuged, which gave a sticky deposit consisting almost entirely of bacilli. This deposit was removed and remains active for at least a week if kept

at a low temperature. No special aseptic precautions are required, as the acidity prevents any other organisms growing. By means of a curved, finely-drawn-out pipette, a suspension of the bacilli in a minimum quantity of water is sterilized, and 5 per cent aqueous solution of lactose is sprayed upon the floor of the mouth and introduced into the cul-de-sacs of the gums, and into spaces between the teeth. The tartar must first be removed from the teeth, and the oral cavity thoroughly washed out with boiled water. This application of the bacilli must be repeated every second day, and the patients should be directed to use pastilles composed of nine parts sterilized lactose and one part dry bacilli. The last can readily be obtained if the centrifuged deposit is spread in a thin layer on glass, and dried rapidly at 35° in vacuo over sulphuric acid. With this procedure these authors have obtained excellent results in cases of buccal and pyorrhœal infections which were unsuccessfully treated by other methods. The treatment was kept up for from seven to twenty-eight days.

Wegell[19] finds that *yoghourt* is contra-indicated in high grades of simple hyperacidity, nervous hypersecretion, and acute stages of gastric ulcer. It may be tentatively used in chronic gastric ulceration. He uses it in chronic catarrh with diminished secretion of gastric juice and in *achylia gastrica*, provided there is not great lack of motile power, as in these cases the partial predigestion of the albumin and the acid introduced assist digestion. He also obtained good results in a case of sprue, in excessive intestinal putrefaction, chronic catarrh of the great and small intestines, and chronic constipation. The effect in tuberculous disease of the intestine was less evident.

Klotz[20] used *yoghourt* milk in a large series of cases in the infant department of a general hospital. He used lactobacillin obtained from Paris to prepare *yoghourt*. Subsequently he tested various other preparations, but found that lactobacillin was the most satisfactory preparation. Klotz found that lactic acid bacilli readily became acclimatized in the intestine. They could usually be recognized in the fæces five or six days after feeding with *yoghourt* was commenced, and persisted for fourteen days after stopping it. He cannot, however, state that the stools were altered in reaction. Only in a minority of the cases was the alkaline reaction rendered neutral or acid. The clinical results show that lactic acid milk preparations are not superior to the ordinary treatment in acute intestinal infections in infants. In **Chronic Disorders of Nutrition** the results were more satisfactory, especially in atrophic conditions. He is not clear how they act. He does not think that the action consists in the destruction or inhibition of other types of putrefactive bacilli, as he could not obtain any evidence of such bactericidal action in experimental cultures carried out *in vitro*. Thus *B. typhosus*, *B. paratyphosus*, *Streptococci*, and *Bacillus coli* grew quite well when added to pure cultures of *B. bulgaricus*, and the same holds true for non-pathogenic organisms. He thinks that it is much more likely the good effect is produced by some unknown products of metabolism which are absorbed and circulate in the blood.

Nephritis, Serum Therapy of.—Tiessier[21] uses the serum obtained from the blood of the renal vein in nephritis and in uræmic conditions. The theory is that this blood must be most rich in the internal secretion of the kidney. To obtain it he ligatures the renal vein of a goat at its junction with the vena cava. The renal vein is then aspirated, and the blood drawn off into a sterile vessel. In the course of the next sixty hours the serum separates completely, and is poured off into small bottles of 20 cc. capacity, which are sealed with boiling paraffin wax. The serum keeps well, and, as a rule, older preparations are preferable to new ones. The serum closely resembles arterial serum. It is of great value in uræmic manifestations, which are rapidly relieved by the injection of the serum. The excretion of urine is stimulated, while the albumin is reduced. The mode of action of the serum is not clearly understood. Tiessier does not think that it acts directly by the introduction of substances which simply neutralize the poisons present. Neither is the action merely one of stimulating diuresis, as the urine secreted is less toxic than before the administration of serum. He is inclined to think that there is some indirect action through the liver. Possibly the toxic products are liberated from a hypothetical combination with chlorine. He suggests that the toxic products thus set free become broken up by the liver, and that the clinical benefit is obtained in this way.

Normal Serum.—Hort[22] believes that the ulceration and destruction of tissue which characterize many diseases may be due to a deficiency in the patient's serum of bodies that normally restrain autolysis or self-destruction of tissue. In a number of diseases, both infective and non-infective, he has been able to inhibit such self-destruction of tissue by the internal or local administration of normal sera rich in anti-destructive bodies. The good effects of the serum are obtained with oral administration. Thus he has treated cases of **Gastric Ulcer, Tuberculous Hæmoptysis, Duodenal Ulcer,** and **Acute Pustular Eczema,** with oral administration of serum; and in a few cases has tried a combination of this treatment with vaccines.

Antilytic Serum.—Hort[23] recommends the internal administration of antilytic serum in the treatment of **Chronic, Gastric, and Duodenal Ulcers.** He attempts in this way to re-establish a condition of immunity of the gastric mucosa to the action of gastrolytic toxins and enzymes, which he suggests are responsible for ulcer production and maintenance. He thinks that one of the main reasons why ulcers fail to heal is, that the thickened floor of the ulcer prevents healthy lymph penetrating to the ulcer. This lymph contains various bodies, some of which apparently antagonize enzymes from fixed cells, from wandering cells, and from bacteria, and thus limit cell-destruction, either autolytic or heterolytic. These antilytic substances can be applied in the form of horse serum, or specially prepared antilytic serum. On testing this theory on chronic superficial ulcers, he found that they rapidly healed up if treated with daily dressings of sterilized gauze saturated with normal horse serum. Similarly, he observed good effects when the

serum is administered internally. It is given by the mouth three or four times in the day directly after food, in ½ oz. of water. If pain is unusually severe, or if hæmorrhage still continues, 60 cc. to 80 cc. may be given in the twenty-four hours, but in all cases 30 cc. is the minimum. In all severe cases the serum is continued for six weeks or longer. The serum used is either fresh normal horse serum or serum with its antilytic valency artificially increased by the addition to normal serum of serum stripped of its globulins. The serum must be fresh, atoxic, and sterile. The horse from which it is drawn must be free from obvious disease, and the dates at which it is bled must be noted, as serum from a later bleeding is more potent to arrest hæmorrhage than from an earlier. The serum may be standardized as regards its power of limiting self-digestion by Golla's conductivity method. Its albumin content, the gauge of antilytic power, can also be chemically estimated. At present its standardization as regards stimulin content cannot be accurately determined, but a very fair idea of the potency of any given sample in this respect may be gained by observing the amount of reaction when applied to an old-standing superficial wound. If the sample tested does not produce a well-marked reaction in twenty-four to thirty-six hours it should be rejected. Relief of pain is marked. In moderate hæmorrhage the bleeding is soon checked, and thus a generous diet can soon be used. Accompanying chlorosis is markedly benefited.

Pyocyanase.—On growing *B. pyocyaneus* on bouillon a thick skin forms on the surface, which settles down on shaking the culture. It is replaced in a few days by another skin of bacteria, which again sinks to the bottom of the flask on shaking. In this way several growths can be obtained. Eventually the bacterial sediment goes into solution, and a clear solution is obtained, probably by the action of some enzyme liberated from the body of dead bacilli. The bacteriolytic properties of the culture fluid are manifested not only for *B. pyocyaneus*, but also for *B. typhosus*, *B. anthracis*, *B. diphtheriæ*, and staphylococci and streptococci. To enable this to be taken advantage of properly, a preparation called pyocyanase has been put upon the market. It consists of a three weeks' culture of *B. pyocyaneus* filtered through a Birkefeld filter, and then concentrated *in vacuo* to one-tenth of its volume.

Emmerich[21] has used pyocyanase in cases of **Diphtheria** as a local application, which is given several times a day as a spray. For this procedure he claims that the fœtor *ex ore* rapidly disappears. The temperature keeps low, or falls to normal. The general condition improves rapidly, and is usually quite good by the second day. The membrane disappears by the third or fourth day. It appears to dissolve gradually, and does not separate in large pieces. He recommends pyocyanase treatment especially for those severe cases of diphtheria which are complicated with pyogenic organisms and under other treatment end usually in local tissue necrosis and general sepsis.

Mühsam[25] has also seen good results from the local use of pyocyanase along with serum injections in severe cases of diphtheria.

Bermbach[26] tried subcutaneous injection in **Tubercle of the Lung,** and found in every case that there was a marked local skin reaction, with redness, swelling, and pain. Accompanying this there was a violent general reaction, consisting of fever, headache, giddiness, nausea, and rapid pulse and vomiting. The fever commenced within a couple of hours of the injection, often with a rigor, and lasted from eight to twenty-four hours, ending with a slow crisis and sweating. The temperature reached 103° or 104°, and the whole reaction corresponded to a short compressed attack of erysipelas. To some extent the administration of pyramidon kept the reaction within bounds.

Kren[27] also found a progressive erysipelatous inflammation of the skin after pyocyanase injection.

Raubitschek and Russ[28] have isolated a lipoid substance out of pyocyanase, and hold that the bactericidal action depends upon this, and not upon an enzyme, as was formerly thought.

Hofbauer[29] found pyocyanase of no use in the local treatment of gonorrhœal infection of women. It caused rapid disappearance of gonococci from the secretions ; but on stopping treatment the cocci reappeared. Evidently the pyocyanase does not penetrate into the tissue, and only affects the superficial layers.

Winkler[30] studied the direct action of pyocyanase on leucocytes, spirilla, spermatozoa, etc., and found that it caused immediate cessation of movement.

Schrötter and Weinberger[31] took advantage of the fact that pyocyanase exerts a marked retarding influence upon the growth of the organism of **Scleroderma.** They injected pyocyanase into sclerodermatous tissue, but found that it caused a marked febrile reaction, with great swelling and redness. The reaction passed off in a couple of days ; but the injection site broke down and suppurated. The end result was that the tissue became much softer.

Antirabic Serum.—Semple,[32] in an interesting paper on the preparation and use of this serum, summarizes his conclusions as follows : (1) By immunizing horses with fixed rabies virus it is possible to prepare a serum having well-marked rabicidal properties. Normal horse serum is devoid of these properties. (2) The rabicidal properties of this serum can be tested by mixing it with fixed virus and subsequently using the mixture to inoculate susceptible animals, such as rabbits, subdurally. (3) The indications for the use of such a serum would seem to be as an adjunct to the ordinary method of treatment in severely bitten and late cases. In severely bitten cases coming early for treatment it might also be injected into the wounds and the tissues in their vicinity. (4) The serum of patients after undergoing a course of antirabic treatment also gives evidence of containing rabicidal substances, and the presence of these substances can be demonstrated in a manner similar to that mentioned in conclusion 2. Normal human serum is devoid of these properties. (5) The rabicidal substances in

the serum of a patient after antirabic treatment are a possible index of the amount of immunity conferred and the efficacy of treatment. (6) Prolonged treatment confers a higher degree of immunity, as judged by the rabicidal effects of the serum on fixed virus, than treatment extended over a shorter period of time. (7) The blood of a patient suffering from hydrophobia fails to infect rabbits when inoculated subdurally. (8) The serum of a patient in the early stages of hydrophobia is capable of prolonging the incubation period for fixed virus when mixed *in vitro* and inoculated subdurally in rabbits.

Tetanus Antitoxin. Vaillard[33] opened an interesting discussion at the Paris Académie de Médecine on the value of prophylactic injections of this antitoxin in man. In veterinary practice the prophylactic use of antitoxin in bovines and equines has proved of inestimable value. Out of 16,917 animals so treated, only one developed tetanus. It is used before operations and after wounds likely to be followed by tetanus. The popularity of antitoxin among veterinary surgeons is shown by the fact that in 1896 only about 1300 cc. were used in France, while in 1906 this had risen to 87,264 cc. The original laboratory experiments on guinea-pigs showed that the antitoxin perfectly neutralized toxin mixed with it in a test tube before injection, while it also possessed the same property if the antitoxin was injected just before or immediately after a dose of toxin. The same held true for injection of living germs into the subcutaneous tissue, but if the germs were injected into muscle, mild tetanus might develop, especially if at the same time some rag was introduced. The serum was antitoxic only, not germicidal. The killing off of the germs is probably effected by phagocytosis. Despite these excellent reports from veterinary sources and experiments, there seems some doubt whether the serum is equally valuable in man. Reynier denied its usefulness, and it was chiefly to meet his statements that the discussion was originated. Dehne and Hamburger, investigating the absorption of antitoxin in man, found that after a dose of 12 to 18 cc. the absorption was somewhat slow, and not completed before forty-eight hours. For the next three or four days the antitoxin circulated in the blood, but then rapidly declined, so that the effective period amounted only to about seven or eight days with this dose. In man, prophylactic injection of antitoxin has been largely used in Paris before operation and with doubtful wounds. The total mortality from tetanus has not declined, but the number of failures from the antitoxin does not seem great, as only about forty-one cases were known in which tetanus had developed after the use of antitoxin. These cases formed the basis of Reynier's statement, but on investigating them Vaillard found that only thirty-one cases could be admitted. In ten cases from seventeen to eighty-seven days elapsed after the use of antitoxin before the appearance of the tetanus, in eight cases from eleven to fourteen days, and in only thirteen cases did tetanus develop within two to ten days after the serum. In regard to these thirteen cases, in many the dose was smaller; in six cases it was only a single dose of 10 cc.. Obviously,

the cases in which tetanus developed long after the elimination of the antitoxin can hardly be counted failures. In man and animals the conditions seem very similar, and it is not likely that the results will be different. Possibly the conditions in man are less favourable, as with very large wounds the animal is immediately destroyed. Roux has shown an interesting point. If an inert mixture of antitoxin and toxin of tetanus or diphtheria be injected into a fresh animal, it produces no symptoms, but in an animal previously treated with injections of other germs—streptococci, pyogenes, etc.—the tissues apparently act upon the mixture, and the animals succumb to tetanus or diphtheria. It is obviously of great importance in human beings to suppress suppuration. As the effective period of retention seems to be only about a week, the serum must be repeated at this interval. The ordinary clinical dose is 10 cc., but this must be increased to double or treble in cases of extensive wounds, especially if there is inclusion of pieces of cloth and if the muscle is involved. The wound must be carefully cleaned and dressed. The serum should be used as soon as possible. With slight wounds, clean cut and readily drained, an initial dose of 10 cc. will suffice, but with deeper, lacerated or contused wounds, 20 or 30 cc. are required. Special care is needed in prolonged suppuration or other septic manifestation. In such cases the dose should be repeated in half the original amount at the end of a week. Dried serum applied to the wound is not reliable, as when it becomes moist it is apt to soak into the dressing instead of passing into the wound. In those cases where tetanus does develop after the antitoxin, the attack seems rather less fatal, as out of the thirty-five such cases only sixteen died.

In the subsequent discussion, Reynier pointed out that the risk of tetanus was slight—probably only about one case in 20,000 wounds developed tetanus under ordinary antiseptic treatment. He seemed to wish antitoxin treatment restricted to those cases in which the specific germ could be detected in the wound. He pointed out that the serum reaction was often severe. On the whole the verdict was in favour of antitoxin. Dentu, Lucas-Championnière and Labbé all spoke in its favour. The latter in particular questioned the value of antiseptic treatment, as in veterinary practice it had proved absolutely unreliable.

Vaccines.—Since it has been proved that animals can be immunized by feeding them on dead tubercle bacilli, the question of administering vaccines by the mouth has become of importance. Latham[34] points out that in such oral administration better results are obtained when the vaccines are given on an empty stomach. The tuberculin can be administered along with normal saline solution or with fresh horse serum. Holt[35] has treated several cases of staphylococcic infection with oral administration of vaccine, and states that the results are encouraging.

Rectal Use of Sera.—Parkinson[36] has used rectal injections of antitoxic sera with success, and states that it has some advantages. The

technique of the injections is extremely simple. It is not necessary to give a cleansing enema unless there is much constipation. The patient lies on the left side on a couch, and a No. 6 Jacques catheter is passed as far as possible into the rectum: to the catheter is attached the barrel of a glass urethral syringe into which the serum is poured; as a rule gravity is sufficient, but if the fluid does not flow readily the piston can be used in the ordinary way. After the injection the patient should be kept lying on the couch for a quarter of an hour, and then can be sent home in a vehicle. Rest in bed is not necessary after the injection, but exertion should not be allowed.

The sera may be absorbed in the rectum, or perhaps the absorption takes place higher up in the intestinal tract, as it has been shown that there is an upward current which carries up substances even while downward peristalsis is going on. More recent experiments show that sera and similar fluids are absorbed by the rectum and other parts of the large intestine. Calmette and Bretonin in a recently published article show that tuberculin is absorbed by the mucous membrane of the rectum, and that the characteristic reaction occurs as quickly and as certainly when the test is injected rectally as when the subcutaneous injection is given. Breton and Petit have shown that tetanus antitoxin is absorbed, as they have immunized guinea-pigs against a poisonous dose of tetanus poison by the rectal injection of the antitoxin. Breton and Massol have shown that both the poison of the cobra and its antitoxin are absorbed by the mucous membrane of the large intestine. Finally, Fornario finds that guinea-pigs, which frequently die during the course of immunization against the plague, are readily immunized by rectal injections, and the mortality from this is practically *nil*, while the protection is equal to that obtained by the hypodermic method. Taking these experiments of different observers in conjunction with the clinical results, it seems that there is not much room for doubt that antitoxic sera are really absorbed when administered by the rectum, and that this is an easy channel for their injection.

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OPOTHERAPY (ANIMAL EXTRACTS).

Glycolitic Ferments.—Odier,[1] of Geneva, advocates injections of glycolytic ferments in **Cancer.** He explains his theory as follows: The blood in cancer is denser than normal, and when incubated at blood heat for one hour does not have its density reduced, as is the case with normal blood. This depends upon the absence or diminution of the normal glycolytic ferment. Consequently the glycogen is not reduced, and the density remains high. Now if glycolytic ferment is injected into carcinomatous or sarcomatous cases in a certain percentage, an immediate improvement is obtained irrespective of the size or situation of the tumour. He has not yet been able to classify the cases which will be improved, but it appears that the quantity of ferment which can be introduced depends upon the malignancy of the tumour. According to Odier, cancer is not a local disease. The local lesion is the expression of a general diathesis. The hypothetical noxious agent he calls cancerogen, and holds that in some way it is bound up, or allied with, glycogen, and that it can be destroyed by glycolytic ferments. The malignant tumour attracts to itself and fixes upon cancerogen circulating in the blood. The proportion of cancerogen present in the tumour bears a relationship to the malignancy of the tumour, and appears to furnish it with nourishment. Cholesterin also seems to play some unknown part in the growth of tumours. It accumulates round the cancer cells.

The glycolytic ferment used by Odier is prepared as follows: Muscle obtained from calves, young bulls, or sheep, and carefully cleansed of fat and tendons, is mixed with three times its weight of pancreas. These are then finely minced and powdered in a mortar and covered with sterile glycerin. This is occasionally stirred with a glass rod, and is kept for twenty-four hours at a temperature between 18° and 20° C. It is then strained through fine muslin, and filtered thrice through thoroughly moistened filter paper, and finally passed through a Chamberland filter B. The final product is put up in flasks containing 20 cc., which should be protected from the light. In ordinary cases 2 cc. are injected twice weekly, and in very slowly advancing cases the frequency of injection depends upon the susceptibility of the patient. This treatment may be combined with arsenical medication. The injections must not be stopped suddenly, as this may prove disastrous for the following reason:—The tissues produce an antibody too feeble to deal with all the extraneous ferment, but as soon as this supply is stopped the antibody may prove too much for the glycolytic ferment produced normally in the body, and so the cancerogen is not destroyed, and the tumour richly supplied with it increases apace.

The advantage of this treatment over trypsin is that the action is essentially general, not local. Injections can be made into any part of the body, and they act upon the tumour irrespective of its size and site.

Liver Extract.—Carles[2] noted distinct improvement in an early case of **Alcoholic Cirrhosis of the Liver** from the use of an extract made by macerating a pig's liver in glycerin. In several other cases he has found the extract of use, but states that this method of treatment should be reserved for early cases of cirrhosis.

Neuriprin. Under this name an extract of cerebrum, preserved with bromine, is used in Italy as a nervine sedative. Pendola[3] reports two cases of **Epilepsy** which were cured by the internal use of neuriprin. Trevisanello[4] found it useful in a severe case of **Spinal** and **Cerebral Neurasthenia.**

Oophorin. This substance is best prepared from the fresh ovary of the pig. The fresh parenchymatous portion is immediately dried and then formed into compressed tablets containing 0·3 to 0·7 gram of dried ovarian tissue. Oophorin is recommended to combat the symptoms attending a natural or artificial **Menopause.** For this purpose, according to Hirschberg,[5] it exerts a specific action. It is of no use for nervous symptoms which come on before the menopause—only for those which accompany it. He reports one peculiar case of a woman aged 32, who, after an operation seven years before, had all the symptoms of artificial menopause. After the use of seventy-five tablets of 0·5 gram each, the patient had a return of menstrual bleeding for the first time in seven years. All the subjective disturbance (flushing, sweating, and faint turns) disappeared. In this case Hirschberg could absolutely exclude any other cause, as malignant tumour, for the bleeding. The preparation is without any danger, and never caused any unpleasant side action. The effect is, however, somewhat transitory, and the drug requires to be periodically given.

Bucura,[6] from experiments on normal and castrated animals, concludes that ovarian extract exerted a deleterious action on the follicles of the ovary. Further, he states that administration of ovarian extract did not prevent the development of castration atrophy of the uterus. These observations seem, however, not to be in accord with previous work.

Pancreas.—Loewi[7] finds that the pancreas regulates the effect of adrenalin on the pupil. In normal man, and in cats and dogs, the instillation of adrenalin into the conjunctival sac is not followed by any alteration in the pupil, but in animals where the pancreas is entirely removed or functionally insufficient, and in many cases of human diabetes (pancreatic ?) the application of adrenalin produces mydriasis. Hence it would appear that the pancreas has the effect of preventing adrenalin from acting on certain organs innervated by the sympathetic system. In exophthalmic goitre the application of adrenalin dilates the pupil, so that apparently hypersecretion of the thyroid also has the same effect.

Parathyroid Gland.—W. N. Berkeley[8] thinks that **Paralysis Agitans** is dependent on functional insufficiency of the parathyroid glands. The post-mortem examination of recent cases does not demonstrate structural alteration in all cases, but as the question concerns the

internal secretion, possibly histological examination may only give a very elementary notion of the functioning power of the glands. He has notes or personal knowledge of thirty cases treated with parathyroid extract. Of these, two patients declined to continue the treatment; two had not been heard from; five denied any benefit; three showed temporary improvement, and eighteen were progressively benefited during the entire period in which they were under treatment. The benefit consisted in diminished rigidity, lessened pain, cure of salivation, shaking diminished or cured, voluntary control of muscles greatly increased, and restlessness and insomnia almost abolished. He points out that benefit can only be obtained from the relatively small doses continued for long periods. The first essential in preparing the extract is the identification of the parathyroid glands. Using the parathyroid gland of the ox, it has been possible to prepare a highly concentrated parathyroid nucleoproteid for use in hypodermic form. The action of this proteid on dying parathyroidectomized dogs was marvellous. It unquestionably contained a large portion of the principle of the gland. He pulverized and preserved the entire gland. The preparation so obtained was dispensed in capsules, each corresponding to one-half of one fresh ox-gland. Three to five capsules were given each day. The dose for hypodermic injection was 0·5 cc. per day. It worked better under the skin than in muscles. Veins should be avoided with special care.

Pituitary Extract.—Etienne and Parisot[9] state that in rabbits repeated injection of pituitary extract produces symptoms somewhat resembling those following adrenalin. Thus there is great rise of blood-pressure, and eventually, if the administration is continued long enough, cardiac hypertrophy is obtained, involving chiefly the left heart. On the other hand there is no development of atheroma, in which respect it differs from adrenalin. During the whole of the administration there is marked polyuria. The pituitary extract at first may produce toxic effects, shown by torpor, diminished response to cutaneous stimuli, transient dyspnœa, and sleep. To these immediate effects immunity is rapidly acquired, but, even in animals treated for long periods with the pituitary extract, fatal poisoning may result from pulmonary œdema.

Trerotoli,[10] using a watery extract of the posterior lobe of the pituitary gland in cases of **Renal** and **Cardiac Disease** found that hypodermic injection was followed by a stronger, more ample, but slower pulse-wave. The irregular heart-action becomes more regular. The blood-pressure rises considerably; the greatest rise is seen about fifteen or twenty minutes after the injection, but lasts for an hour or more. No unpleasant symptoms, local or general, were seen, and Trerotoli recommends the use of pituitary extract as a cardiac tonic.

Thyroid Gland.—Gordon[11] believes that migraine and epilepsy have in some cases an undoubted relationship to a faulty thyroid function. In pregnancy, where there is a functional hyperactivity of the thyroid gland, migraine patients are practically free from attacks. He reports

several cases of **Migraine** which resisted ordinary dietetic and sedative treatment and rapidly improved with thyroid medication. The attacks became much more rare and diminished in severity. He also obtained definite improvement in cases of **Idiopathic Epilepsy** associated with defective metabolic processes. On administering thyroid preparations, the patient becomes much brighter, and the fits are greatly reduced in number and severity.

Leopold Levi and Rothschild[12] report favourably of the use of thyroid medication in thirty-seven cases of chronic **Rheumatism.** The cases were observed for three years, and varied in age from twelve to sixty-five years. Ten of the cases were chronic deforming rheumatism, and five had been bedridden for years. In nine cases there was a history of subacute exacerbations, ankylosis, deformity, and persistent pain. Of these, fourteen improved considerably as regards pain, use of joints, deformity, and articular deviation, while two were completely cured. The twenty other cases were instances of medium or more benign types of rheumatism, and eighteen of these were improved or cured. The results were most favourable in cases where the joint changes were not profound, where the lesions were restricted, the patients young, and the onset of the disease recent. The dose was one to three cachets daily, containing 1½ gr. of dried thyroid powder, equivalent to 7½ gr. of the fresh gland.

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BÉRANECK'S TUBERCULIN: HOW TO USE IT.

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In this article a brief outline is given of the ideas which guided the writer in the preparation of his tuberculin; and he then proceeds to show what may reasonably be expected from its use in the treatment of human tuberculosis.

"To immunize an animal hitherto normal against tuberculosis is truly no easy task; while to control the disease in an animal already in the grip of tuberculosis is an even more difficult problem. The tubercle bacillus which has found its way into an organism favourable to its development does not remain idle. It is a living thing, and as such borrows from its surroundings such food-stuffs as its life demands; while in these surroundings it forms toxins, which will in their turn produce a morbid effect upon the patient. Thus, at the outset of specific treatment the tuberculous subject already harbours a more or less virulent bacillus with which his natural defensive mechanism is barely able to cope. An infection of varying extent is accompanied by an intoxication of varying intensity. We must, therefore, aim at: (1) Preventing the spread of the infection by strengthening the resistance of the leucocytes to the necrosing power of the bacillus, and bringing into play their bacteriolytic ferments; (2) Encouraging the production of antibodies to neutralize the bacillary toxins.

"To compass this end, we cannot resort to inoculation with living or even attenuated bacilli, as is done in the immunization of a normal animal, for we cannot measure the pathological effect of a similar vaccine injected into an organism which is the seat of tuberculosis. Much less can we make use of living though attenuated tubercle bacilli, or even of dead bacilli, as we know with what difficulty they are absorbed by the cells whose duty it is to destroy them. We must therefore have recourse to soluble tuberculous toxins, which are more readily absorbed by the organism, and whose pathological effects can be more accurately gauged." (*Béraneck, Washington Congress*, 1908.)

The Koch bacillus attacks its host by means of diffusible, readily soluble exotoxins, and by the much less diffusible endotoxins, which remain within the body of the bacillus. In the development of the disease it is the endotoxins which play the principal part and constitute the most effective weapon wielded by the bacilli. The exotoxins also contribute to this, though less conspicuously. By inoculating cattle with virulent cultures of *B. tuberculosis* enclosed within collodion capsules, or "Chamberland bougies," the exotoxins alone are brought into action. In these circumstances Moussu[2] notes that the health of the animals remains good, while the continued secretion of

exotoxins by the living cultures sensitizes the animals who then react to the injection of tuberculin.

To prepare a tuberculin containing both endotoxins and exotoxins, which may be used as a vaccine—is the task the writer has set himself, and endeavoured to realize. His tuberculin includes: (1) Exotoxins formed by the Koch bacillus in his bouillon medium: (2) Endotoxins extracted from the bodies of bacilli by orthophosphoric acid, 1 per cent.

No commercial peptone is added to the writer's bouillon, which is prepared by maceration of veal and glycerinated, but not neutralized. Experiment shows that these peptones, when injected into tuberculous guinea-pigs, exercise an appreciably toxic action, which interferes with the action of true tuberculous exotoxins. After cultivation the bouillon is filtered through paper, then through a Chamberland filter; then it is evaporated, cold, *in vacuo*, to a syrupy consistency. The bacilli, separated by filtration from their culture medium, are thoroughly washed to remove all trace of endotoxin. They are immersed in 1 per cent orthophosphoric acid, in which they are macerated in a water bath at 60° C. for two hours. After cooling, the preparation is filtered, and the filtrate thus obtained contains the specific endotoxins of tuberculosis. His tuberculin consists of a mixture of equal parts of the bouillon evaporated to a syrup (exotoxins), and of the orthophosphoric acid extract of the bacilli (endotoxins).

The tuberculin is but slightly toxic, since 10 cc. injected subcutaneously into a normal guinea-pig fails to kill. A dose of 1 cc. is, however, fatal to a tuberculous guinea-pig weighing from 700 to 1000 grams. A person the subject of tuberculosis is very sensitive to this tuberculin; in fact, he often reacts to a dose of .000001 cc. or even less. Some particularly sensitive patients can bear no more than .00000006 cc., and are much improved by this homœopathic dose. While its toxic action is feeble, the tuberculin produces a well-marked reaction (temperature, pulse, leucocytosis, etc.) in tuberculous patients.

The exotoxins and endotoxins contained in this tuberculin are connected on the one hand with the biological properties of the Koch bacillus, on the other with the chemical composition of the medium in which the micro-organisms were grown. They are not identical with the toxins formed by tubercle bacilli in the human body, though they are closely related. These little differences in quality and quantity between tuberculous toxins formed *in vitro* and those found *in vivo* will alone explain the therapeutic action exercised by the toxins in tuberculin in connection with those actually built up in the patient's body. When we start tuberculin treatment, we are dealing with a body already infected with tuberculosis, and incapable of arresting the progress of the disease by its own unaided resources. If we injected toxins in tuberculin identical with those produced by the living bacilli, we should be going in exactly the wrong direction. For how could it be that, if a dose x of tuberculous toxins produces physiological decay of the organism, and increases the local lesions, a dose $x + a$ of these toxins (supposing that the toxins produced *in vivo* are

the same as those present in the tuberculin) can by a miracle cause a precisely opposite effect ? A tuberculin is not a serum ; it contains no antibodies. Its use in treatment is only justified by its being a vaccine through its relation to toxins formed *in vivo* by the Koch bacillus. The term " vaccine " implies the presence of toxins of lower pathogenicity, more freely absorbed by the inoculated person, and therefore in a condition to stimulate, not to inhibit, the patient's means of defence. It has, then, been the writer's aim to prepare a tuberculin whose toxins would be only slightly pathogenic while they would stimulate the patient's defensive mechanism. Nevertheless, this stimulant action is relative, not absolute, for it depends on the power of the patient's body to absorb the injected toxins (i.e., in the tuberculin), and to answer to their stimulation by a physiological reaction of therapeutic value.

But the power just alluded to, on which the success of the treatment hangs, varies not only with different individuals ; it also fluctuates in the same patient at different phases of the disease. These considerations are of the greatest importance in ensuring a rational plan for treatment by the writer's tuberculin, and enable us to understand why the same tuberculin which, when injected in a certain dose, stimulates the defensive mechanism, produces no such effect when injected in a larger dose. It is because this essential fact is not grasped, that treatment by this tuberculin often fails in the very cases where good results ought to be obtained. It is a mistake to inject the largest possible dose of tuberculin, and to suppose that immunization progresses *pari passu* with the quantity of tuberculin got in within a given time. To proceed thus is to take the wrong road ; for it means adding to those toxins already produced in the living subject others (tuberculin) which, although they constitute a vaccine, will of themselves exercise a harmful action if injected in excessive doses. The important thing is to employ cautious dosage, until the exact amount which will excite and strengthen the resistance of the patient to tuberculosis is ascertained. This is what is called the useful or optimum dose.

From the foregoing considerations there issue two rules relative to the use of this tuberculin : (1) A small dose of a very dilute solution should be employed to begin with. This rule applies to all cases, but with particular force to those with fever ; (2) The same dose must be injected three or four times at least before any definite estimate of its action as a vaccine can be arrived at. If the action seems favourable, the same dosage will be continued for weeks, or even months, so long as the patient continues to benefit from the treatment. If after three or four injections the initial dose appears to do no good, it should be increased by ·05 cc. : never more. Suppose this new dose after three or four repetitions does no good, increase it again by ·05 cc. : and so on, till a useful dose is arrived at, which should then be repeated as long as the patient improves. To go beyond the optimum dose, on the ground that, being well borne, more still

would doubtless be tolerated, is to risk a change from the vaccine action of the useful dose to a neutral or even harmful effect. The risk is in reality that of giving the protective cells of the body an overdose of tuberculin—more of the vaccine-toxins than they can absorb and use in the struggle with tuberculosis.

It may seem puerile to increase the dose of tuberculin by ·05 cc. only; but this cautious rate of increment is based on clinical observation. A more rapid increase, say by ·1 cc., has in practice often been found too much; and in some cases, indeed, the optimum dose may be overstepped by one increase of ·1 cc. only. We can thus easily understand why Professor Sahli, who has given several years to the clinical study of this tuberculin, has thought it necessary to establish a scale of solutions, each of which (beginning with a very weak one) contains twice as much tuberculin as the one before. To make this clearer Professor Sahli's actual scale is appended.[3] The tuberculin is sent out to the profession in seventeen solutions, labelled — $\frac{A}{512}$; $\frac{A}{256}$; $\frac{A}{128}$; $\frac{A}{64}$; $\frac{A}{32}$; $\frac{A}{16}$; $\frac{A}{8}$; $\frac{A}{4}$; $\frac{A}{2}$; A; B; C; D; E; F; G; H. The weakest solution is $\frac{A}{512}$; each of those following it contains, as he says, twice as much tuberculin as the one before, up to H, which is practically a pure tuberculin.

For the moment the writer will ignore surgical tuberculosis, and deal only with that of the internal organs. Various forms are treated by his tuberculin; and, as a rule, by injections every third day. For patients with a normal temperature the first dose is ·05 cc. of solution $\frac{A}{128}$. Following the rule stated above, this is increased by ·05 cc. till ·5 cc. of $\frac{A}{128}$ is reached. If even then no useful effect follows, and there is no reaction (pulse, temperature, local induration), solution $\frac{A}{64}$ should next be used, beginning with ·05 cc., and so on, till the optimum dose is found. If reactions occur in the course of treatment, a smaller, better-tolerated dose should be adopted, and continued for a time; for these reactions are the index that the limit of the patient's tolerance for injected toxins has been reached.

Needless to say, the optimum dose varies in different individuals. In some, it is found after several injections of ·05 cc. of $\frac{A}{128}$; in others, in the solutions $\frac{A}{64}$ or $\frac{A}{32}$. In such cases as are suitable for this treatment, it is very unusual to have to run through the whole scale of solutions up to H before arriving at this optimum dose. If the tuberculin injected according to the foregoing scheme fails to strengthen the body's defences, and no optimum dose can be found, its therapeutic effect will be *nil*. Unfortunately, except by a sufficiently protracted trial, we have no way of ascertaining whether the protective cells of a body infected with tuberculosis are still capable of being favourably stimulated by the vaccinic toxins of this tuberculin. Nevertheless, before giving up the treatment, it is well to institute control tests to see whether the optimum dose may not have been passed, although the injections seem to have been borne throughout without reaction. The initial solution, for instance $\frac{A}{128}$, is taken afresh, in a dose of ·05 or ·1 cc., sometimes with a surprising improvement in the

results obtained. John and Volhard,[4] who, however, have no personal experience of the use of this tuberculin, claim that it is not applicable to definitely febrile cases. This is a loose statement; clinical data prove that the tuberculin may exercise an antipyretic action, regulating the temperature-curve even when it reaches 102° F., or higher. For this purpose, however, the first dose must be ·05 cc. of solution $\frac{A}{2\,5\,6}$ or of $\frac{A}{5\,1\,2}$. For in these febrile cases the optimum dose is quickly passed; often it is but ·1 or ·15 cc. of solution $\frac{A}{2\,5\,6}$. Since the optimum is often so near to the initial dose, it is sometimes useful in feverish and feeble patients to begin with ·05 cc. of $\frac{A}{5\,1\,2}$.

An observation recorded by Guillermin,[5] to which the writer will briefly refer, very characteristically illustrates the antipyretic action of repeated injections of the optimum dose of this tuberculin. It deals with a woman, treated at the Medical Polyclinic of the University of Geneva. For the general history of the case the original article must be consulted. The writer will only refer to the following points: She had lesions in both lungs, with frequent congestive attacks, accompanied by evening temperatures of 102° F. and over. Between the attacks the evening temperature occasionally fell almost to normal; there were many bacilli in the sputum. Treatment under these unfavourable conditions was begun with ·1 cc. of $\frac{A}{1\,2\,8}$. The first injection was followed by a slight reaction (as compared with the temperature on the foregoing days): it was too large a dose for the general and local conditions. The next injection was ·1 cc. of $\frac{A}{2\,5\,6}$; this had a definite but transient antipyretic effect. On the strength of this result ·2, and then ·3 cc., of $\frac{A}{2\,5\,6}$ were injected; this proved too rapid an increase, for the temperature went up again. A return to a dose of ·1 cc. of $\frac{A}{2\,5\,6}$ reproduced the fall in temperature. Evidently this was the optimum dose for the case in point. For special reasons, the patient was admitted to the wards, under a physician who had not practised the method of treatment expounded above. Instead of going on with the optimum dose, he proceeded immediately to the injection of $\frac{A}{5\,1\,2}$ in doses of ·1 to ·5 cc., supposing, no doubt, that so far the patient had not had sufficient doses of tuberculin. The temperature went up again, for the physician had largely exceeded the useful dose. Till she left the hospital the patient's temperature remained high, and even went above 102° F. On her return to the Polyclinic, the original optimum dose, ·1 cc. of $\frac{A}{2\,5\,6}$, was resumed. Once more, for a time at any rate, the antipyretic action was seen in a steadying of the temperature. At this juncture she left the country, and the treatment was broken off.

This is a very instructive case, for it shows clearly what constitutes the optimum dose—the dose which, for a given patient, will activate and strengthen the body's defensive mechanism. This case further shows us how easy it is to cross the line between the optimum dose and one that is no longer useful. The injection of ·1 cc. of $\frac{A}{2\,5\,6}$ did the patient good; but the injection of ·2 cc., and still more of ·3 cc., failed to do so. If the writer insists on these technical points it is because he

has learnt how absolutely important they are in securing the maximum value out of his tuberculin treatment. In Guillermin's patient the optimum dose was, so to speak, homœopathic, 000,000 c.c. of pure tuberculin. An injection of twice this dose only overshot the mark, and the stimulating action of the tuberculin was lost.

The optimum dose can only be found in each particular case by groping after it. For this two things are necessary—careful observation of all the symptoms, and a cautiously graduated dosage. If the injection is accompanied by some reaction, either general (temperature, pulse, weariness), or local (at the point of inoculation), it is a sign that the optimum dose has been exceeded, and that a smaller must be reverted to. It goes without saying that several varying optimum doses may be noted in the course of a treatment, for this dose is nothing but an adaptation, as nearly accurate as possible, of the injected toxins to the physiological requirements of the body's means of defence. This adaptability is liable to self-modification in the course of the disease, and it will then only be satisfied afresh by different doses of tuberculin, stronger or weaker according to the circumstances of the moment.

But, some one may ask, would not systematic study of the opsonic index guide us in tuberculin treatment, determining the optimum dose in each case? The writer does not think so. So far as tuberculin is concerned, Wright's interesting method affords us no certain control of the therapeutic effect of specific treatment. It shows us the "opsonic" activity of the serum of a tuberculous patient as compared with that of a normal person. It shows us the relative phagocytic activity of the leucocytes of a tuberculous individual. But the phagocytic power, while it has an indisputable controlling value is not by itself an adequate criterion of the degree of immunization against the Koch bacillus and its toxins which the body possesses. The more or less complete ingestion of the bacilli by phagocytes *in vitro* is not everything. Immunization is actual only when the micro-organisms are taken and digested *in vivo*, and their toxins neutralized. Wright's method only deals with one side of the question—the most apparent, it is true, but not the most essential. It tells us the absorptive power of the phagocytes in relation to tubercle bacilli, but it tells us nothing about the bacteriolytic and toxinolytic powers of these same phagocytes, nor about the readiness of the tissues to undergo repair with cicatrization of the existing lesions. Because of this, the degree of immunization obtained by a course of tuberculin treatment and revealed by the therapeutic results seen does not necessarily coincide with a return to the normal on the part of the opsonic index. Some patients get on well in spite of a subnormal opsonic index, while others remain where they were, or get worse, with an opsonic index at or above normal.

Certainly, Wright's method has been of great service in teaching us about the negative phase which usually follows the injection of tuberculin, and may last several days. A rational method of treating tuberculosis by specific means must take account of this important

principle, by observing more or less of an interval between the injections. Theoretically, each injection should be postponed until the end of the negative phase following the one before. In practice, this is not necessary, for observation shows that the injection of tuberculin before the end of the negative phase often raises the opsonic index instead of lowering it further. The facts accumulated by Kinghorn, Twichell, Carter, and Werry[6] in Trudeau's laboratory at Saranac Lake (U.S.A.) are in this respect quite conclusive. In the conclusions of their communication to the International Tuberculosis Congress at Washington, 1908, these writers say :—" That when they gave injections at intervals of three to four days, one quarter of the doses were given when the opsonic index was still at the negative phase ; that when an injection was made during a negative phase the index was rarely depressed still further, but that a positive phase at once set in. . . . They regard the tuberculo-opsonic index test as one of fair accuracy ; but think that it is of doubtful value to control tuberculin injections in phthisical patients. They think that the aim of tuberculin treatment is rather to produce tuberculin immunization than merely to keep the opsonic index at a high level." It goes without saying that a tuberculous patient's opsonic index is a datum worth knowing ; but it cannot be used to control the general management of treatment by this tuberculin, nor to find the optimum dose suited to each particular patient. In this connection, one cannot do better than quote the opinion of Dr. Philip,[7] the distinguished director of the Royal Victoria Hospital for Consumption, Edinburgh. He says, " The possession of an exact gauge for the regulation of tuberculin dosage is certainly desirable. This would seem to be promised in the determination of the opsonic index of the blood from day to day. . . . Interesting facts have emerged regarding the variations which occur in the blood at different stages of tuberculous infection. . . . But after comparison of results obtained where the opsonic index was determined, and those obtained apart from such determination, I feel doubtful if the method can be credited with all the significance which has been ascribed to it. Prolonged experience with and without the method justifies the statement that, apart from estimation of the index, other clinical evidence is usually sufficient for the regulation, both of amount and frequency of dosage."

Of the two components of the writer's tuberculin, exotoxins and endotoxins, we know the origin and chemical nature of the latter alone. We know that they are extracted from the actual bodies of the bacilli, and that they belong to the group of acid-albumins. As for the exotoxins, we cannot give them a positive chemical definition, for it is difficult, if not impossible, to separate them from the organic substances with which they are mixed in the culture bouillon. Further, we must not forget that the toxins contained in our culture media may represent chemical modifications of the nutritive constituents of these media, just as much as secretions of the bacilli growing there. We may thus hope, by changing either the quantity or the quality of the foodstuffs contained in our culture broths, to bring about a modifica-

tion of the exotoxins contained in these special media. The writer has tried in this way to diminish certain harmful potentialities of the toxins elaborated by the tubercle bacillus, especially their vasodilator action. As early as 1891 Professor Bouchard[8] noted in Koch's tuberculin a vasodilator toxin which he called "Ectasine." It is this toxin which is largely responsible for the accidents which sometimes occur after too large a dose of Koch's tuberculin. It is an accepted idea that acute intoxication by this tuberculin is accompanied by hæmorrhagic foci in the various organs. The writer has succeeded in largely reducing the amount of ectasine produced in his bouillon cultures, so that his tuberculin has a far less marked vasodilator action than Koch's; and is, therefore, less dangerous to handle. This is certainly an advantage from the therapeutic point of view. For diagnostic purposes, however, it is a drawback; for this tuberculin diluted to 1 or 2 per cent. and instilled into the eye of tuberculous persons, causes, as a rule, no ophthalmo-reaction, such as Wolff-Eissner and Calmette have brought into prominence. Not only does it fail to cause an ophthalmo-reaction, but further, when injected hypodermically, it does not reactivate the ophthalmo-reaction as in the case of Koch's tuberculin. I owe this interesting observation to the courtesy of Dr. Bauer, of Neuchâtel.

It might be supposed that this tuberculin gives no ophthalmo-reaction because it is less toxic, and therefore too weak. This is not correct, as the facts set forth in this article show. Indeed, this tuberculin injected under the skin in tuberculous individuals may cause a general or local reaction in doses of .0000001 cc., or even of .00000006 cc.; while dropped into the eye in a 1 or 2 per cent solution it causes no ophthalmo-reaction. The capacity of this tuberculin to cause a general reaction is therefore very definite, while its vasodilator action is weak. We can but conclude from these facts that the vasodilator toxin secreted by the tubercle bacillus is different from those toxins which excite a pulse-temperature reaction in tuberculous individuals. By cultural contrivances it is possible to hinder the formation of the vasodilator toxin while leaving other tuberculous exotoxins untouched. The writer insists on this special feature of his tuberculin, in order that practitioners may not be led into diagnostic mistakes by expecting an ophthalmo-reaction with it. If his tuberculin is to be employed for purposes of diagnosis, a temperature reaction should be looked for after hypodermic injection in persons who are tuberculous, or suspected of tuberculosis. It is useless for the ophthalmic test.

Since Koch's startling communication to the London Congress in 1901, the question as to whether human and bovine tuberculosis constitute one or separate infections has given rise to numerous researches. Koch, as is well known, threw all the weight of his great scientific authority on the side of the dual theory. This question is one not merely of theoretical, but also of practical interest the more so because, according to Koch and his school, bovine tuberculosis invades man with difficulty, and even then does not become generalized,

The scope of this article does not allow the writer to set forth or discuss the arguments used by the dualist school. His point of view is that the differences in morphology, biology, and pathology between the human and bovine types of tuberculosis are due to a prolonged adaptation of these bacilli to different animal species. The human and the bovine type are therefore no more than varieties of a common species. It is very hard to say which of the two kinds of bacilli is responsible for the tuberculous lesions seen in man, for our criteria in this distinction are only relative (cultural characteristics, and results of inoculation into rodents, such as the rabbit or guinea-pig, or into bovines). It is, however, beyond doubt that bovine tubercle bacilli introduced with food into the human body may set up a tuberculosis which differs in no clinical respect from that caused by the human bacillus. V. Behring's experiments on the vaccination of bovines against tuberculosis by means of human bacilli have lent credence to the idea that the human bacillus is the "vaccine" against the bovine micro-organism, and vice versa. It is admitted that in treating different forms of human tuberculosis tuberculins must be used, some of which were originally prepared from human, others from bovine, bacilli. The practitioner should therefore have two tuberculins at his disposal: the one, human, reserved for lesions due to bovine bacilli; the other, bovine, for such as are caused by human bacilli. This idea springs from too hasty a generalization; the experimental data on which it rests are too slender to afford a sound basis for practical indications as to the treatment of the various forms of tuberculosis in man.

It is true that to a limited extent human bacilli may be used to immunize cattle against bovine tuberculosis. But do not the experiments of Calmette and Guérin[9] show that as definite an immunization may be obtained by the use of bovine bacilli? There is therefore no need to turn to a heterotypical vaccine (from human bacilli) to immunize cattle against bovine tuberculosis, and everything leads to a similar conclusion in regard to the immunization of man against human tuberculosis. This tuberculin, prepared at the outset from human bacilli, is of use in the treatment of every kind of tuberculosis seen in man. Clinical experience shows it to be equally serviceable in internal and in surgical tuberculosis. The writer need hardly say that in rapidly-advancing cases of meningeal or miliary tuberculosis, the chance of success is almost *nil*. If the results of treatment in pulmonary tuberculosis are less satisfactory than those gained in surgical lesions, it is because, on the one hand, the organ damaged is a more important one; on the other, the case is too far advanced when treatment is begun.

In conclusion, the writer will briefly summarize the essential data of this article:—

1. This tuberculin is not a serum; it contains no anti-bodies. It does contain exotoxins formed by the tubercle bacillus in the writer's bouillon culture, and endotoxins extracted from the bodies of the bacilli by a special method.

2. The writer's tuberculin is very slightly toxic for the normal animal; on the other hand, its power of inducing a reaction—in the widest sense of the word—is very marked in tuberculous patients.

3. The toxins entering into its composition are not identical with those formed by the tubercle bacillus *in vivo*, although they belong to the same family. They are attenuated, and, so to speak, selected, so as to exert a vaccine function.

4. The curative action of this tuberculin upon tuberculous processes consists in a stimulation of the body's defences and a reinforcement of their resistance to the pathogenic action of the tubercle bacillus and its toxins. If these means of defence are not in a condition to be favourably influenced by this tuberculin, the therapeutic result will be *nil*. Hence the importance of beginning the treatment as soon as tuberculosis is diagnosed or even suspected.

5. It is a mistake to aim at injecting the maximum possible dose of tuberculin in order to induce immunization; further doses injected should be adapted to the needs of the body, so as to point it towards recovery if possible. This adaptation will be most perfectly realized by the optimum dose or doses, repeated even for months so long as a useful result follows.

6. Febrile cases are quite suitable for treatment by the writer's tuberculin provided the rules he has laid down be observed. It seems to him that it would be advantageous to use this tuberculin as a prophylactic measure for children born of tuberculous parents into imperfectly hygienic surroundings.

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OPSONINS AND VACCINES.

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The accuracy of Wright's method of determining the opsonic index has more than once been questioned, and practically every stage in the technique has been closely criticized. Fleming, of St. Mary's Hospital,[1] does valuable work in calling attention to the pitfalls which lie in the path of the observer, and at the same time deals with some of the points urged by those who have thrown doubt on the accuracy of the technique. With regard to the constancy of the control, he finds that the tuberculo-opsonic index of healthy persons is wonderfully constant, only a very small percentage falling outside the limits of 0·90 and 1·10, so that when the average of several such controls is used it forms a very good standard for comparison with the serum of infected persons from day to day. The observer should be able to take accurate and equal quantities of the washed corpuscles, the bacillary emulsion, and the serum into the pipette, but it is useful to remember that the greatest accuracy is necessary with regard to the bacillary emulsion, while the amount of serum may be varied considerably without making any difference.

The degree of phagocytosis is directly in proportion to the time of the incubation of the mixture, and so pipettes which are to be compared should be incubated for exactly the same length of time, yet a difference of a few seconds would not destroy the accuracy of an observation. Air bubbles in the pipette mixture must be avoided, as they make the count very irregular. With a diminution of washed corpuscles in the opsonic mixture, there is an increase in the amount of phagocytosis, so that it is absolutely necessary to secure an emulsion of constant dilution in mixtures which are to be compared, and hence the method adopted by some observers of pipetting the corpuscles direct from the salt solution in which they have been washed is inaccurate unless the corpuscles have been first well mixed after the supernatant salt solution has been drawn off.

We have now to deal with an error which escaped the earlier observers of opsonic technique, namely, the effect of agglutination of the washed red corpuscles on the amount of phagocytosis. Some red corpuscles are not agglutinated by any sera, others by the sera of other individuals, and others again are agglutinated by their own serum. When such agglutination occurs it profoundly

alters the amount of phagocytosis, the rule being that under these conditions the opsonic index is greatly raised. Accuracy requires, then, that the observer should satisfy himself that the red corpuscles which are necessarily mixed with the leucocytes are not agglutinable. Apart from agglutination, the source of the washed corpuscles does not affect the result.

The serum used must be free from red corpuscles. This may seem strange when we consider that the opsonic mixture already contains an abundance of red corpuscles mixed with the whites; but whatever the explanation, Fleming's figures show that the presence of blood in the serum causes such a great fall in the amount of phagocytosis as to render the observation quite worthless.

An important question is the length of time for which a serum will retain its full opsonic power. Fleming shows that if the serum be properly sealed up in its capsule and kept at room temperature, it will retain its full power for four or five days, whether it be healthy or pathological blood; but if the capsule be left open for a few hours, very untrustworthy readings result.

There is still one occasional source of error which should perhaps have been mentioned earlier, namely, the overheating of the blood at the time of sealing the capsule in a flame.

The Effect of Yeast Fat on the Staphylo-opsonic Index. The value of yeast in the treatment of furunculosis and acne is now pretty generally recognized, and many attempts have been made to discover the way in which yeast acts in these diseases. Nuclein, the most important of the nitrogenous constituents of yeast, is held to have a mild bactericidal action *in vitro*, and what is perhaps of greater importance, produces an increase in the polymorphonuclear leucocytes very soon after its administration. A fat constituent of yeast has been isolated by Roos and Hinsberg and designated "Ceridin" and the effect of this fat on the staphylo-opsonic index has been the object of an investigation by J. W. H. Eyre.[2] He found that the oral administration of this yeast fat in doses beginning at 0·1 gram thrice daily, and gradually increased to three times that amount, caused first an immediate and marked rise of the opsonic index lasting from two to four days, then a rapid fall to below the original level, also extending over some days, followed by a steady and gradual rise to just above normal, where it remained stationary in spite of the increase in the amount of yeast fat administered. The observations were made on patients suffering from a staphylococcal infection viz., either acne indurata or furunculosis, and it is interesting to note that in spite of the variations in the opsonic index, there was no marked improvement in the skin condition, although some of the patients expressed themselves as feeling distinctly better. Possibly the rise in the index was due to a normal opsonin rather than to an immune opsonin.

Is it necessary to estimate the Opsonic Index in Vaccine Treatment? —Since it has become definitely established that many diseases are

curable by means of vaccine treatment, and since it is quite clear that the method of determining the opsonic index requires a considerable amount of experience and skill, it is only natural that a desire should spring up among members of the medical profession, to reap the benefits of a vaccine without availing themselves of the help which a knowledge of the opsonic index affords. There can no longer be any doubt that, provided only small doses be used and at sufficiently long intervals, vaccine treatment is capable of doing immense good in certain diseases, such as furunculosis, or localized tuberculous infections, without any appeal being made to the opsonic index; and if such treatment can be conducted without danger to the patient, then it is obvious that vaccine treatment becomes available for many who could not possibly afford the further expense of repeated estimations of the opsonic index. On the other hand, if such vaccinations, though successful in some cases, are liable to do definite harm in others, then it is essential that those who are availing themselves of vaccine-therapy should realize the limitations of what one may call the "uncontrolled method."

Sir Almroth Wright[3] points out that as, in the case of both the vaccine and the human organism, we are dealing with factors which are neither constant nor variable, it is necessary, if we would avoid the risk of doing real harm, to limit ourselves to such small doses that many patients would hardly be benefited at all. Still, in the case of a staphylococcus vaccine, a dose corresponding to 100 million cocci may be relied upon to produce a positive phase in a patient who is developing an isolated furuncle, and a dose of 250 millions four days later may be relied upon to reinforce the action of the previous dose. In the same way a dose of 2 million streptococci will abort an incipient case of streptococcic lymphangitis. Again, a limited tuberculous lesion will usually be benefited by a dose not exceeding $\frac{1}{20000}$ mgram of a dried and comminuted tubercle culture, but such a dose may soon prove too small to be effectual, while on the other hand in many cases it could not with advantage be exceeded. These arguments will of course be met with the suggestion that the immunizator may judge his dose by the clinical symptoms and progress of his patient, and in the case of some localized infections situated favourably for observation this may be true; the symptoms of the patient may clearly show us that the administration of the vaccine has been followed by a short negative phase, in turn followed by amelioration of symptoms extending over the period between two inoculations; in such a case we may assume that a useful dose has been administered. But unfortunately such cases are comparatively rare, and often the clinical signs not only fail to help but actually deceive us. Again, in many cases progress is necessarily so slow that the information derived from the clinical signs arrives too late to serve as a guide to dosage. When treating an acute febrile condition the temperature should fall as the antibacterial potency of the blood increases, but it is notorious that an excessive intoxication may condition a fall in temperature, and it is

conceivable that a rise may denote a response to immunization. At any rate we cannot rely on the temperature chart furnishing us with a guide as to the dose of our vaccine or the correct time for its administration.

There remains still another class of case in which the need of some guide other than the clinical signs is felt, and that is when the case under vaccine treatment has so far improved that we are uncertain whether the infection has been eradicated or still exists; in such a case much harm may result from discontinuing the treatment too soon under the impression that the infection has been finally conquered: observations of the opsonic index might prove that it still existed, although both local and general symptoms were in abeyance.

One is forced to the conclusion that although in certain cases a large measure of success may attend the "uncontrolled" administration of vaccines, yet in the majority of infections such treatment is neither as safe for the patient nor as likely to be followed by a successful result as when controlled by observations of the opsonic index.

The Opsonic Index in Infants.—J. H. Wells,[1] after a large number of experiments, concludes: (1) A low opsonic index is not diagnostic in children under one year of age; (2) In infants a low opsonic index is not inconsistent with health, and the child may be thriving with a declining index; (3) Where the opsonic index is low this will rise in response to the stimulus of an inoculation with a bacterial vaccine; (4) The healthy, breast-fed infant possesses no advantages over the healthy artificially-fed child; (5) The anti bacterial defence in children cannot depend on the opsonic content of the serum.

The Opsonic Index in Diabetes.—The well-recognized susceptibility of diabetic individuals to boils and carbuncles, spontaneous gangrene, and pulmonary tuberculosis, suggests a lack of bactericidal power which one would expect to see reflected in the opsonic index of such persons, and indeed reports of a lowered index to the staphylococcus and the tubercle bacillus have appeared from time to time in medical literature. Da Costa published a series of twenty-two cases about two years years ago, and the same investigator with Bousfield[2] now adds observations of fifty two more cases, making a total of seventy-four. Their results are in harmony with the clinical tiers which are recognized with regard to the infections which too frequently complicate diabetes, and their conclusions may well be quoted in their own words:

"1. In diabetics, as a class, the resisting powers of the blood against bacterial infection are conspicuously subnormal, in comparison with a similar hæmic property in the healthy individual. As measured by the opsonic index, the average diabetic's resistance is approximately one-third below normal, and, in the exceptional case, reduced more than two-thirds. This applies to infections by the streptococcus, the staphylococcus, and the bacillus of tuberculosis, whose relative predilection for the diabetic is expressed by the order given.

"2. The higher grades of diabetic glycosuria are attended by a

feebler opsono-phagocytic action than the lower grades, and the reverse of this also is true. This deficiency is particularly striking in the case of the tubercle bacillus.

" 3. Diabetic acidosis particularly lowers the blood resistance to the bacillus of tuberculosis, but a less degree of vulnerability appears to exist with regard to the streptococcus and the staphylococcus.

" 4. Diabetic furunculosis does not materially depress the subject's opsono-phagocytic powers to the ordinary pyogenic cocci below the figures usually incident to this disease.

" 5. Diabetics affected with pulmonary tuberculosis show virtually the same resisting powers as do subjects of uncomplicated diabetes.

" 6. In non-saccharine diabetes the opsonic values to the staphylococcus range within normal limits, and this statement also applies to non-diabetic glycosuria.

" In conclusion, we would advise the use of the opsonic test in diabetes mellitus as a means of gauging, in a general way, the extent to which the subject's vitality is undermined, and for this purpose the test is especially useful in patients threatened with acid intoxication, and in those having excessive glycosuria. Systematic opsonic records in an average case of diabetes reflect most clearly the inroads of this affection, as well as the patient's behaviour under the stress thereby imposed. Of this we have ample proof in numerous patients in whom repeated examinations were made, over extended periods of time. In this connection also, the opsonic test, hitherto studied only in its relation to infectious processes, should be useful in the investigation of several other conditions—gout, rickets, jaundice, and cachexias consequent to chronic nephritis, hepatic cirrhosis, malignant disease, and severe anæmia."

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RADIOTHERAPEUTICS AND ELECTROTHERAPEUTICS.

BY

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The past year has been a very important one in this department. It has seen the further development of the application of X rays in diagnosis and treatment to an extent never reached before. Concurrently with this has been great improvement in methods, and in the quality of the work turned out. The future of X-ray diagnosis would appear to be a very brilliant one, and apparently the time is not far distant when the X-ray tube will be in use almost as frequently as the clinical thermometer or stethoscope.

In the matter of published works, the year has not been very prolific.

Prof. Leduc has published a small manual on "The Ions in Medicine," which contains a vast amount of information for its limited size. It ought to be read by every medical man in active practice who wishes to be in a position to understand and prescribe up-to-date therapeutic methods.

Dr. Wilfrid Harris has written a very excellent handbook of "Electrical Treatment" (Cassell & Co.), which should be in the hands of every seriously minded electrotherapeutist.

A work quite unique is an "X-ray Atlas of Surgical Pathology" ("Atlas Chirurgisch pathologischer Röntgenbilda"), by Dr. Rudolf Grashey (G. F. Lehmann's Verlag, München, 1908. Price 22 marks). It is a most valuable work, profusely illustrated with excellent radiographs of every condition likely to be met with by the radiographer, and it will greatly assist the interpretation of doubtful negatives.

An equally valuable work is an "Atlas de Radiologie Normale" by Drs. Hauchamps, Klynens and Mahaux (Paris: O. Doin. Price fr. 20). This is without doubt the best atlas of normal radiographs that has yet appeared. The plates are fully explained, both as regards their production and interpretation. It is a work that ought to be in the hands of every busy surgeon and most physicians, in view of the value of a good normal radiograph when examining plates of cases under their care. The work is so good it ought to be translated into English for the benefit of British practitioners.

APPARATUS.

Whatever is new in the apparatus produced during the past year is in the nature of improvements upon already existing devices. If one considers what is the weakest part of an X-ray outfit, it is easy to guess where the improvements have taken place. At the beginning

of the year the Sanitas Electrical Co. brought out what is known as the Sanax break (*Fig.* 1), which we consider one of the most successful interrupters yet introduced. Its working principle is different from any other. The mercury and paraffin are enclosed in a more or less globular hollow container of cast iron, which is mounted upon the vertically placed shaft of an electric motor and revolves with it. As the speed increases, the mercury rises higher and higher, until it forms an equatorial band around the inside of the container. Through an opening in the top is mounted a fibre disc with two metal segments, so that its edge can be made to touch the revolving mercurial band. This latter drives the disc around, and, as the metal segments engage the mercury, contact is made, and vice versa. By virtue of centrifugal force, the mercury has no tendency to follow the disc, so that the break is very sudden and complete. The mercury is not churned up or emulsified as in most others.

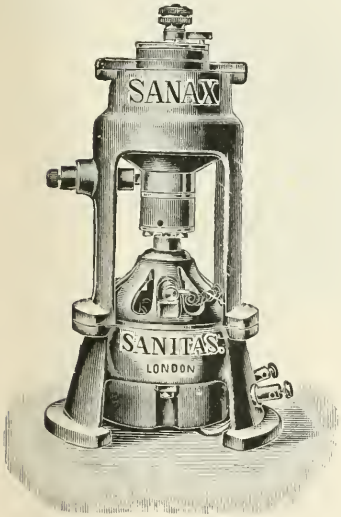


Fig. 1.

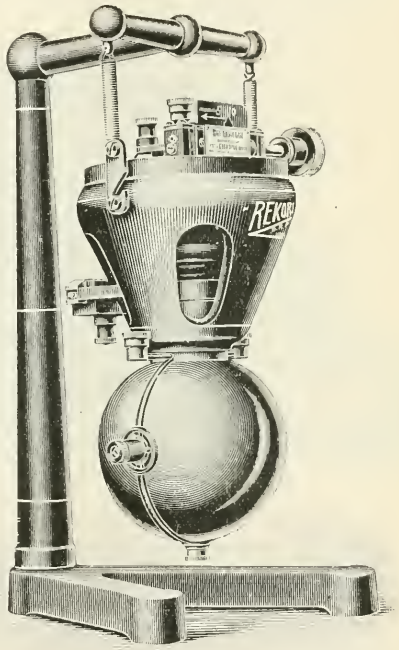


Fig. 2.

We have had one in use for over twelve months, and though it has never been cleaned, it works as well as ever. In use care should be taken not to switch on the main current until the motor has reached its proper speed, and also to switch off before stopping the motor. Neglect of this may cause a slight explosion, which, though not dangerous in any way, is likely to scatter dirty paraffin oil about the place.

On very much the same principle is a new break just brought out by Mr. K. Schall (*Fig.* 2). He uses the same whirling band of mercury, but

in place of the revolving disc used in the Sanax a small copper bar is made to dip in and out of the mercury twice in each revolution. It is mounted with a spring suspension, is very silent in action, is a somewhat cheaper instrument than the other, and seems to be equally efficient.

Yet another form of break is the Greville-Gaiffe gas interrupter (*Fig.* 3). It appears to be one in which single or multiple contacts can be thrown into action. Working as a single contact break, it is essentially the same as any good form of mercury jet break. When the multiple contacts are brought into use, the output of the coil is much intensified; so much so that an electrolytic break can be dispensed with, and as much as forty ampères can be passed through the primary winding of the coil. This would indeed be a great boon, besides simplifying

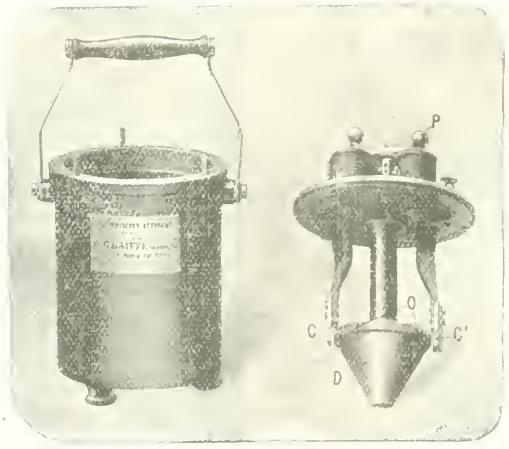


Fig. 3.—The Greville-Gaiffe Gas Break.

the X-ray outfit. The dielectric employed in this instrument is hydrogen or coal gas. The illustration shows on the left the iron receptacle to hold the mercury and gas. Into this is fitted the apparatus shown on the right. *P* is the motor apparatus, which once started runs independently of any current through the primary winding of the coil. Its speed is regulated by a rheostat not shown. *D* is the cone traversed by four canals whose orifices are indicated at points marked *O*. *C* is a tooth connected with the motor apparatus when the main current is switched on and the motor started. Four mercury jets traverse the four canals in cone *D*, and each makes contact with *C* consecutively. *C'* is another tooth which comes into action when a switch (not shown) is turned to "Normal." The four jets then also make contact "consecutively" with this tooth which transmits up to about 10 ampères of current through the primary winding at a pressure of 220 volts. Four other teeth (not shown) are

added to the apparatus, and can be simultaneously switched on to the primary winding of the coil. They are so placed that the four jets are at the same time transmitting current to the four teeth, one jet to each tooth. The total current is therefore four times greater than that transmitted by one tooth. As contact is broken at the four teeth simultaneously, there is an enormous discharge at the secondary terminals of the coil. The agents are the Medical Supply Association, Gray's Inn Road.

Recently, Mr. Wright, of Newton & Co., has invented a new break which has some very good points (*Fig.* 4). The principle is the same as the Mackenzie-Davidson so far as the make and break are concerned, but with this important difference, that the revolving blade, instead of dipping into a mass of stagnant mercury at the bottom of the

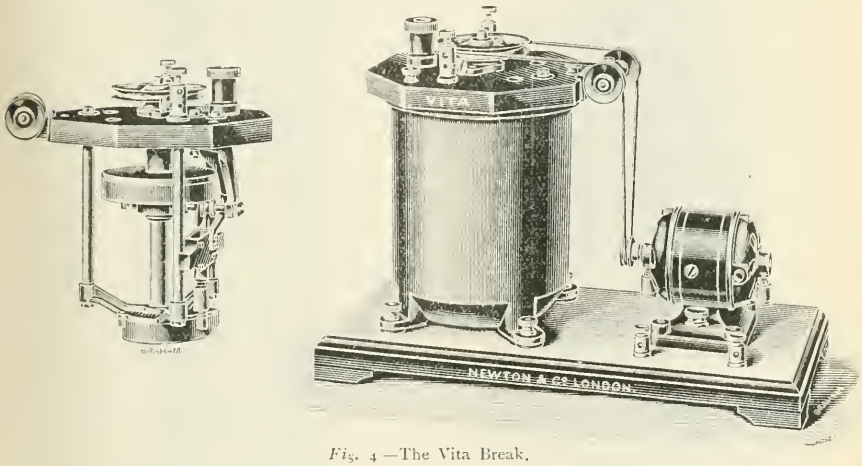


Fig. 4.—The Vita Break.

vessel, dips into a small trough of mercury which is kept full and overflowing with clean mercury. The great advantage is that the mercury is not only always clean, but is kept up to the same level, no matter at what speed the blade revolves. The great fault in the Mackenzie-Davidson break was that at a high speed the blade made a groove in the mercury, so that the higher the speed the less complete the contact between the blade and the mercury. There was thus always a certain speed which it was inadvisable to exceed—in fact, in our experience with the Mackenzie-Davidson break, the best results were obtained when it was run so slowly that the explosions could almost be counted. With this new modification any speed is permissible and every contact is full and complete. At a high speed the discharge between the secondary terminals is very much the same as when an electrolytic break is used.

In America an entirely new apparatus has lately been brought out which may have an important influence on future designs and

installations. It is the invention of Mr H. C. Snook, of Philadelphia, and so far the results have been most satisfactory. It consists of three essential parts: (1) An electric motor provided with two slip rings from which a single-phase alternating current can be collected up to 15 or 20 ampères, to supply the primary winding of (2) a closed circuit transformer, the secondary of which is wound to give the necessary voltage for X-ray work. This high-tension alternating current is led to (3) a rectifying commutator, which is constructed to deal safely and effectually with such a current: this commutator is mounted on an extension of the shaft of the motor above referred to, and revolves with it. It is thus always in synchronism with the phases of the current, so that by its use the X-ray tube receives a purely unidirectional, though pulsating, current. This current through the tube can be varied from a mere fraction of a milliampère up to fifty milliampères or more. No valve tubes or interrupters are necessary, and the whole apparatus is so simple that there is nothing to get out of order. It has been in regular use by Lester Leonard, of Philadelphia, for a considerable time with the utmost satisfaction, and it was shown working at Amsterdam in September with complete success. Its simplicity and efficiency will ensure its popularity with those who take up X-ray work seriously. It is being manufactured in this country by Messrs. Newton & Co (*Fig* 5).

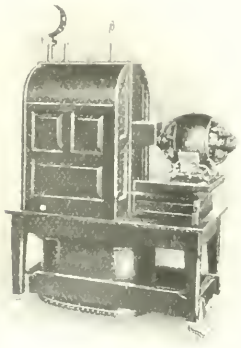


Fig.

Hulst has done some excellent work with a huge static machine having fifty large plates mounted on a vertical shaft and driven directly by an electric motor, also with its shaft placed vertically. The apparatus is however too costly and cumbersome for most people.

Gaiffe, of Paris, has brought out a new coil, the Rochefort transformer, which appears to have a very high efficiency. An essential feature is the use of a special dielectric paste, which is said to be the best for this purpose, and enables the secondary winding to be placed nearer the primary without fear of breakdown. In this coil the secondary consists of a single bobbin of wire, occupying only a small part of the length of the primary, and placed around the middle of the latter. The agent in this country is the Medical Supply Association, 228–230, Gray's Inn Road, London (*Figs.* 6, 7).

The X-ray tube would appear to be slowly—very slowly—progressing towards a greater degree of perfection, but it must be admitted that it still remains the most uncertain and difficult-to understand part of the X-ray outfit. It seems quite impossible to build two tubes

the exact counterparts of each other in regard to activity and penetration during every-day work. It may now safely be said that the erratic tendencies of the X-ray tube are practically the only cause of failure in radiography. Other sources of failure are easily recognized and adjusted, but not so the tube. As in everything else, the experienced worker has less trouble and gets better results than the novice, but there is probably no radiographer, however great his experience, to whom the state of the tube does not constitute a source of more or less anxiety. As a result of the general desire to shorten exposures, many have installed larger and more powerful coils, and these call

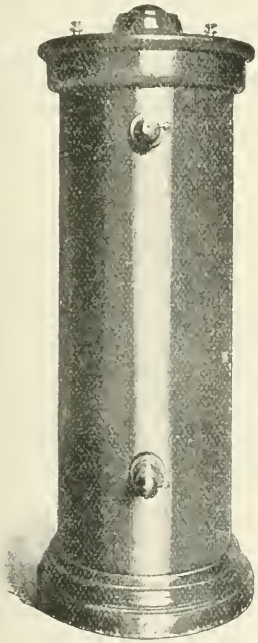


Fig. 6.

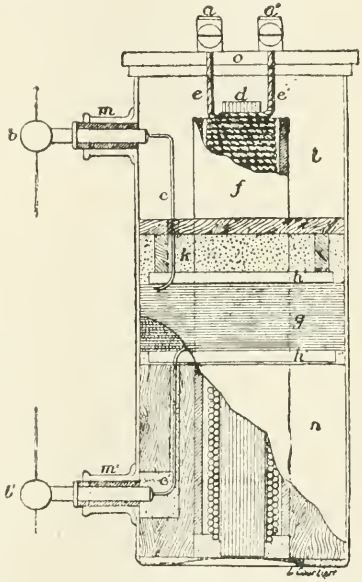


Fig. 7.

for larger tubes with heavy anodes. Solid metal seems to be preferred to water-cooled anodes, which do not appear to be gaining in popularity. Though excellent in theory, in practice water does not seem to be able to absorb the heat with the rapidity demanded by the heavy currents now employed.

One drawback to the heavy anode tube is the instability of its vacuum except when used for brief exposures. As is well known, most light anode tubes can be easily and comparatively quickly "seasoned," as it is called, but with heavy ones the large mass of metal absorbs so much gas, which is given out as soon as the metal becomes heated, and the vacuum of the tube falls, with a corresponding

loss of penetrative power. Of course, such a tube can be "seasoned," but it takes an inconveniently long time—the more so with German tubes, which are almost invariably sent out in a very "soft" condition. We are convinced that there exists among radiographers a demand for a well-seasoned tube—one with which it would be possible to take a full set of radiographs of the urinary system without its altering its vacuum to any important extent, even though the patient happened to be of the more robust type. It might be advisable for some tube manufacturer to take this matter up, as the extra price and shorter life would not have any influence with a busy radiographer who wanted a reliable tube in a hurry.

By the use of a new and cheap alloy which has the same coefficient of expansion as glass, Gundelach has mounted the anode on a stout copper tube, having a section of the alloy where it passes through the glass, and on its external part places a number of radiating discs from which the heat readily escapes. He maintains that such a tube can be worked for long periods without becoming hotter than boiling water. The heat seemed to escape very readily in the one we tested.

ELECTROTHERAPEUTICS.

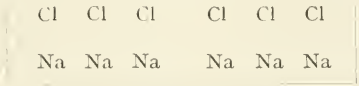
The use of electricity in medicine and surgery continues to progress in its usual steady manner, but there is no doubt that this progress has been retarded by the incursion of the Röntgen rays into the field of the electrotherapeutist, and the advance made during recent years is not so great as would have taken place under ordinary circumstances. X ray work has a well-merited fascination of its own, apart from its being more or less of a novelty, and this has led many to neglect the study of electrotherapeutics proper, who would otherwise have done much to develop the latter. The most important feature of the work of the past year has been in the direction of **Ionic Medication.** This field of usefulness is continually widening, and it bids fair to become a very important branch of therapeutics. The use of zinc ions for rodent ulcer has been referred to in previous issues of this work, and it is perhaps more popular as a method of treatment than ever before.

This method of administering drugs is a practical application of the latest ideas concerning the phenomena accompanying the process known as electrolysis. Substances which when dissolved in water are conductors of electricity are called electrolytes, and the molecules of the dissolved electrolyte are mobile relatively to each other as in a gas, and have the same tendency to diffuse themselves in a homogeneous manner. In fact, from a molecular point of view the analogy between a gas and a solid in solution is a very perfect one.

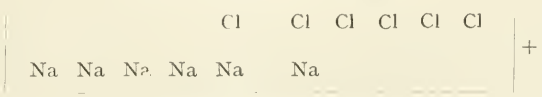
In such a solution the molecules become separated—undergo *dissociation* as it is called, but in any given solution the atoms of the dissolved substance always bear a certain definite relationship to each other. Sodium chloride, for instance, breaks up into sodium and chlorine, but each sodium atom is accompanied by its chlorine atom. Thus each molecule contains two separate bodies which are called *ions*

Now these ions carry definite charges of electricity. In the case of metals, and some alkaloids, the charge is a positive one, while in the case of non-metals, such as chlorine, iodine, etc., it is negative. It is the presence of this electrical charge which prevents the element manifesting itself in its ordinary form, and in such a solution the positive and negative charges are exactly balanced.

If, however, we take some means of upsetting this normal state of balance, the elements are set free in their ordinary form and deposited on the surface of the electrodes. This is most easily done by passing a constant current through the solution, the immediate effect of which is to set up a migration of the ions. The ions of the metals carry positive charges and move with the current—that is from the anode to the kathode. The ions of the non-metals carry negative charges and move against the current. We may represent this graphically by a diagram representing a solution of common salt in a vessel across the middle of which is placed a partition of animal membrane.

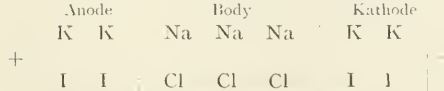


BEFORE THE CURRENT IS TURNED ON.

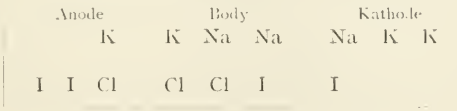


AFTER THE CURRENT HAS PASSED.

Here we see the sodium ions have moved with the current and accumulated at the negative pole −, the reverse having taken place in the case of the chlorine ions. It will be noticed also that this has taken place notwithstanding that a membranous partition has been placed across their path. In fact, a dozen or so of such partitions might have been interposed for all the difference it would make as regards the ultimate result. Now let us see what happens when we interpose the body, or some part of it, in the path between the electrodes. We will represent the body as a solution of sodium chloride, and as it is desired to introduce potassium iodide into the part we will represent the electrodes as being of this substance.



BEFORE THE CURRENT IS TURNED ON.



AFTER THE CURRENT HAS PASSED.

Here we see that the normal constituents of the part have been displaced by the ions of the electrodes; that is, we have substituted a molecule of potassium iodide for one of sodium chloride, but not entirely as such, since the iodine ion has gone in under the negative electrode while the potassium ion is under the anode. As the chlorine ion is of great value in promoting the absorption and disappearance of adventitious fibrous tissue, it may seem difficult to understand why this is so, considering that sodium chloride is already present in the tissues to such a great extent. On this point Leduc says, "The metal penetrates into the body under the anode the acid radical under the kathode. The result, therefore, is to change the nature of the salts in the organism. The acid is changed under the kathode and the metal under the anode. If the radical and the metal are the same as those of the organism, which is almost the case when we employ as electrode a solution of chloride of sodium the effects produced under the electrode are reduced to a minimum. They are not, however, suppressed, for chlorine is not the only electro negative radical of the organism, and sodium is not the only electro-positive ion, and the exclusive substitution of chloride of sodium for all the salts of the economy has consequences which may result in the death of the tissues."

More recent and extensive knowledge of the process of electrolysis as applied to medication has pointed out the error of many ideas entertained. For instance, it was denied that the method could have any good effect, since all the medicament would be washed away by the circulation as quickly as it passed through or even into the deeper layers of the skin. While much of what reaches the intercellular spaces would be washed away, it has been shown that the ions easily penetrate the protoplasm of the cells, and remain there for a considerable time, producing their own characteristic effects. Further, it is now known that with prolonged application and large currents the ions can be made to penetrate to the deeper parts in such amount as to produce results peculiar to themselves.

The successful practice of ionic medication necessitates the carrying out of the most minute precautions in every detail. The chemicals and the water for dissolving them must be of the highest purity, and the same applies to the absorbent lint used for electrodes. The latter must be quite free from alkali or other extraneous substances, and a sufficient thickness should be used to prevent the ions from the metal of the electrode reaching the patient's skin in the course of the application. Where possible, the metal of the electrode and of the electrolytic solution should be the same.

The advantages of the ionic method are very obvious. It enables us to be more scientific in our treatment of local conditions. By its means we can introduce a drug exactly where it is required, and only in sufficient quantity to produce the desired effect. How much better than the present system of giving large doses by the mouth on the off chance that some of it will reach and act upon the comparatively small part one wishes to influence

Recently the employment of the chlorine ion has been attracting some attention by virtue of its property of promoting the absorption of fibrous and scar tissue. Dawson Turner [1] has reported its successful use in **Palmar Contracture,** and Lewis Jones [2] has also given a valuable paper on ionic medicine generally. Turner in the same connection mentions apparent benefit in cases of **Sclerotic Changes in the Spinal Cord.** Sloan [3] has found the ionic method a most useful one for **Sterilization of the Vulva, Vagina, and Uterus,** and also in the treatment of numerous diseases of the female pelvis. He describes his methods of procedure. Speaking generally, all the solutions used for ionic medication are of a strength of from 1 to 2 per cent, and the pad saturated with this solution is placed over the desired spot, with the proper electrode over all. For the chlorine ion we use a solution of sodium chloride and the negative pole. If we wish to use the ions of any of the metals, a solution made of a soluble salt of the metal chosen is placed under the positive pole. The principles underlying ionic medication will be found in Leduc's book already referred to. The whole subject bristles with possibilities, and we await their full development with much interest.

Turner [4] has made some valuable suggestions regarding the treatment of **Aneurysm** by electrolysis. He found that the character of the clot produced varied very much with the metal of which the anode was composed. He tried several metals, but when zinc was used he got a firm glove-like precipitate which clung to the electrode and was formed without the evolution of gas. He suggests that surgeons wishing to treat an aneurysm should use zinc wire, and not other metals, which apparently have no action beyond that of a foreign body.

In the treatment of painful conditions where counter-irritation is contra-indicated, the positive pole constant current still holds the field. One hears occasionally of the good results obtained from the positive pole of a static machine, but this is not the experience of all by any means, whereas most observers are satisfied as to the sedative action of the constant current when the anode is placed over the painful area.

It may be as well to point out that this sedative action is not so apparent when the current from the main is used, this being less soothing than the current obtained from a battery. The more up-to-date turbogenerators now in use by supply companies run at a higher speed, necessitating fewer armature coils and wider commutator bars, and the resulting current is not constant or even continuous. The most one can say for it is that it is unidirectional. It is really a series of fairly coarse ripples, and as such stands in an intermediate position between the constant and intermittent currents. If we wish to get the maximum sedative effects, we should use the current from a battery rather than from a commercial generator.

In the case which the writer recorded of its successful use in **Meralgia Paræsthetica,** [5] a battery was used which no doubt in some measure contributed to the excellent result. A proof of the uneven-

ness of the current from the main is obtained in the slight shocks one receives occasionally when handling apparatus connected thereto. The sensation is more like that from a faradic coil than the pricking and burning sensation of a truly constant current.

In the treatment of **Muscular Conditions**, such as weakness, wasting, paralysis, etc., there is a very decided tendency towards the use of slowly varying or rhythmic currents. It does not seem important whether the current is made to grow stronger and weaker alternately—always flowing in the one direction—or is also reversed in direction as in the sinusoidal current. The main requirement is that the current should continually vary in magnitude.

It will be obvious that such a current is much more suitable than ordinary galvanic or faradic currents. The galvanic or constant current is not sufficiently stimulating to the muscular fibres, while in the faradic the pulsations follow one another too rapidly to benefit the fibres directly. While some specialists have a preference for a slowly pulsating current such as one obtains with a metronome interrupter in circuit, we have for the past three years advocated the slow sinusoidal current, because it is so easy to generate, and possesses greater freedom from trouble with the products of electrolysis. Elsewhere[6] the writer has published a paper on the value of such currents in **Atonic Conditions of the Digestive System**, and experience shows the method to be a very efficient one, though time and patience are required to bring about a successful result; but it must be remembered that no treatment will bring about a rapid cure in a true case of atony of the colon.

We consider this growth in popularity of treatment by slowly varying currents a good omen for the future of electrotherapeutics, and if anything we have done has helped to this end in ever so small a way, the reward is a handsome one.

High-frequency Currents.—From the paucity of papers on the subject, it would appear that the general application of high-frequency currents as a reasonably successful method of dealing with certain specific diseased conditions has more or less passed out of use. While it is admitted that such applications increase metabolism, or induce drowsiness, etc., the fact remains that their employment in the form of the condenser couch or large solenoid has not been conspicuously successful. Gardiner[7] has recorded a list of varied experiences, but his results are inconclusive.

As a local application, however, the case is quite different. During the past year we have treated many cases of **Port-wine Stain** with excellent results, the method being to apply the current from the top of the resonator through a metal point electrode, holding the latter a little distance off the surface to be treated. The same method has recently been brought forward by Continental specialists for the treatment of **Malignant Tumours**, and has been dignified by the name of "fulguration." Several papers on the subject have appeared during the past year, and while it is too soon to say whether the method

is of any value, we propose to give a fairly full abstract of a few of the most important papers as a guide to the present position of this new modification in electrotherapeutics. To Keating Hart is given the credit for being the first in the field.

Czerny,[8] in a very complete paper, describes the process fully. The essential features are: Most intense brush discharges from a metal electrode are directed for from five to forty minutes at a distance of from 2 to 4 cms. to the cancerous part, the spot on which the discharge plays being changed; the patient must be under an anæsthetic. After this the cancerous part is removed by a knife or sharp spoon, and the wound is exposed again to fulguration for from five to fifteen minutes to kill any remaining cancerous cells. For apparatus he advises the most powerful that it is safe to use, such as a 20-in. coil and a high-frequency apparatus, the condenser of which is immersed in oil. The brush discharge is from 10 cms. to 20 cms. in length.

He describes the action of the application on healthy skin. Here the thermal effect is first noticeable, and a small blister appears in a few seconds. This goes down, and soon a burn forms, which increases in size and depth with the duration and intensity of the application. The capillaries are pierced in places, and drops of blood appear, but this stops very soon owing to coagulation, which this process seems to hasten. Applied to larger areas and moving the electrode rapidly from place to place, a "goose-skin" condition is set up, but later the part becomes red and blisters form.

Keating Hart considers the thermal effect superfluous, and tries to eliminate it by combining in the electrode a hollow vulcanite nozzle through which carbonic acid gas from a cylinder is directed. Others, however, consider the thermal effect valuable as assisting the destructive process. One effect is to cause a very lively flow of lymph from the part treated, with greatly increased phagocytosis and a tendency to heal quickly. In Czerny's opinion there is a smashing up of the cancer cells, which have a much less resisting power than healthy tissue cells. The effect on the former would seem to be very pronounced from the microscopic sections he shows of a growth before and after fulguration. He has treated sixteen cases, and of these there were three deaths, seven were improved, and six were apparently quite cured. The treatment must be carried out very thoroughly, as cancer cells which escape destruction may grow more rapidly than before. He considers the method safer and quicker than treatment with radium or X rays. This paper should be referred to directly for fuller information; it is well illustrated with electrodes, microscopic sections, etc. Wiesner,[9] in a short paper which is more or less supplementary to that of Czerny, thinks that by means of fulguration valuable results have been obtained, and that it is worth while to try it on a larger scale. Very powerful effleuve is to be used, the spark gap being set to a distance of from 6 to 10 cms. All speculæ, etc., are to be earthed, otherwise the assistants holding them would receive painful shocks. For the benefit of those who want a reference to

a paper written in English, there is one by Cook[10] which may be read. It deals more with various diseases than cancer in particular.

As a counterblast to all this, Nagelschmidt[11] says that no selective action on certain cells can take place, and refers the whole result to the thermic effect, denying the cooling action of the CO_2 which Keating Hart passes through the electrodes. Both in theory and practice he believes that fulguration is a clumsy and costly method of applying heat. While this may be true, it is difficult to believe that heat is the only factor concerned in the effects produced by fulguration. We are quite sure that very few of the cases of port-wine stain we have treated by the method would have done as well if the surface had been scorched by heat alone, unless it were done so severely as to leave a large amount of unsightly scarring. As a treatment for simple **Warts**, fulguration has been most successful, and the surprising thing about it is the very small amount of sparking that is required, so little as to cause only the most trifling disturbance of sensation. There is no evidence to show that a correspondingly slight application of heat would produce the same result.

We are not claiming for fulguration any power of curing cancer, but we have always maintained—in previous issues of this volume and elsewhere—that the high-frequency spark was capable of producing effects more or less peculiar to itself and also that the chief value of high-frequency currents would eventually be found to lie in their employment as a local application.

Worrall[12] has found high-frequency currents locally applied to be useful in **Sciatica.**

REFERENCES.—[1]*Trans. Roy. Soc. Med.* 1907–8; [2]*Ibid.* also *Brit. Med. Jour.* Oct. 17, 1908; [3]*Trans. Roy. Soc. Med.* July, 1908; [4]*Lancet*, June 20, 1908; [5]*Ibid.* Mar. 28, 1908; [6]*Ibid.* May 16, 1908; [7]*Scot. Med. and Surg. Jour.* Feb. 1908; [8]*Münch. med. Woch.* Feb. 11, 1908; [9]*Ibid.* Mar. 17, 1908; [10]*Med. Rec.* Dec. 21, 1907; [11]*Deut. med. Woch.* Mar. 5, 1908; [12]*Archives of the Röntgen Ray*, Mar. 1908.

PHOTOTHERAPY.

Phototherapy continues to maintain its well-deserved and enviable position as a successful method of combating **Lupus**, a disease which was the cause of many cases of almost hideous disfigurement in spite of all that could be done. Sequeira[1] has published the results of seven years' experience of the Finsen treatment, and this makes very pleasant reading. The following table gives a summary:—

Cures	429	71[illegible]	per cent.
Improved	107	17[illegible]	"
Failures	23	[illegible]	"
Other treatment preferred	25	[illegible]	"
Deaths	15	[illegible]	"
	599		
Ceased attending	50		
Under treatment or observation on May 1st, 1907	142		
	791		

Counting the cures and the improved cases together as those in which the Finsen treatment proved beneficial, the percentage is 89·4. In only 7·8 per cent of the cases the treatment proved unsuccessful or appeared to be of less utility than other measures.

The last item, "Deaths," requires an explanation. Under this heading he says :—"Fifteen patients have died : four from pulmonary tuberculosis, two from appendix abscess, one from heart disease, three from epithelioma secondary to the lupus, one from epithelioma of the larynx independent of the lupus, one from pneumonia, and one from 'fits.' In two instances we have no information as to the cause of death. It may be of interest here to note that in the patients who died from pulmonary tuberculosis the cutaneous lesions entirely disappeared before death."

The paper is very useful and instructive, besides being a record of a large amount of very creditable work.

Rockwell[2] has had good results with phototherapy in the treatment of painful **Neuritis.** He gives no description of the apparatus used, or of the method employed, but as he speaks of "an incandescent light of 500-candle power" (? leucodescent lamp), probably light, heat, and chemical rays were present.

Domenici[3] records a case of general **Psoriasis** in which, it having resisted arsenic, potassium iodide, baths, and various unguents, he advised exposure to the sun's rays, for twenty minutes daily, of the front, back, and sides of the whole body. At the end of the summer there only remained a few patches on the extensor surfaces of the limbs, and these did not spread during the following winter. With the return of summer treatment was resumed, and by the end of August the case was completely cured, and had remained so for a year at the time the case was reported.

In this connection we may mention that recently Tomkinson, of Glasgow, related to us the details of a case of chronic intractable **Eczema** in which, the patient leaving for Egypt for the season, he advised exposure to the sun's rays of the affected parts. In this a healthy reaction also took place, resulting in a complete cure. It is unfortunate that this method is impracticable in this country for systematic treatment, but as some patients are in a position to visit more sunny places when necessary, it is as well to keep in mind this evidence of the therapeutic value of the solar rays.

Kime[4] gives his experience in the use of solar rays. He employs large glass condensers for concentrating the rays, and interposes blue glass to cut off the heat rays. He is convinced of the actinic and penetrative power of such rays, and he has obtained interesting results in both superficial and deep conditions.

Riedel[5] has endeavoured to attain similar results by the use of an arc light so arranged as to give an approximately correct solar spectrum, the only difference being that the arc light was richer in ultra-violet rays, the latter rays, in the case of the sun, being nearly all absorbed

by the atmosphere. In skin cases he applies this light four or five times a week for twenty to thirty minutes. His aim is to produce a primary hyperæmia only, which is generally accompanied by local perspiration. He gives a table of his results, comprising **Eczema, Pruritus, Herpes, Acne, Sycosis,** etc., and his results will compare very favourably with the more classical methods.

REFERENCES.—[1]*Lancet*, Mar. 7, 1908; [2]*Med. Rec.* Nov. 9, 1907; [3]*Sem. Méd.* Dec. 11, 1907; [4]*N. Y. Med. Journ.* June 4, 1908; [5]*Münch. med. Woch.* Mar. 31, 1908.

RADIUM.

There have been very few contributions on the subject of radium treatment during the past year, but there would seem to be a change in the attitude of many in regard to it. We, among many others, have held that radium was useful therapeutically by virtue of the X rays it gave off, and that, beyond the fact that it could be used in places inaccessible to the rays from an X-ray tube, it possessed no advantages over the latter.

In the Electrical Section of the Annual Meeting of the British Medical Association, Mr. W. Deane Butcher read a paper on this subject, and particularly referred to its action in cases of **Pruritus** where, after X rays and other measures had failed, a successful result followed the application of radium, of which he is the fortunate possessor of a very excellent specimen. This he has had mounted in a platinum capsule with a window of talc so well secured in place that there is no danger of moisture gaining access to the interior. He considers talc to be the only substance that is permissible if the best results are to be obtained from the radium, and that when it is hermetically sealed in glass tubes a very large proportion of the therapeutically active rays are absorbed before they reach the area under treatment.

Abbe[1] has had very good success in the treatment of neoplasms with radium enclosed in glass tubes, but what he loses by the glass he makes up for in the relatively large quantities of radium he has at his command. His success in the treatment of **Epitheliomata** and **Sarcomata** about the head and face is very remarkable. He gives a chart of seventy-seven such cases, which shows them to be grouped chiefly about the nose and eyelids; and he says that in every one of these some improvement took place after radium applications, but in some of them where the deeper layers were involved the invasion would sometimes run ahead of the tissue treated. He is inclined to regard radium as a specific for these small superficial malignant growths. There is no doubt that it is the great scarcity and costliness of radium that militates against its progress as a therapeutic agent. Those who have the largest quantities to use seem to get the best results from it. When the time comes that we can employ grams where we now use milligrams, a great advance will take place in its usefulness. Abbe has also found radium succeed after X rays had failed.

We do not know if capsules of *uviol* glass have been tried for containing radium, but in view of its greater transparency to ultra-violet rays it is just possible that it might have a less absorbing action on the rays and emanations from radium.

Reference.—*Med. Rec.* Oct. 12, 1907.

X-RAY DIAGNOSIS.

The past year has been important, both as regards new methods, and in further applications of those methods in medical and surgical diagnosis. One noteworthy feature is the fact that nearly every one is advocating the use of softer tubes. Formerly it seemed impossible to get good results with such tubes when radiographing the thicker parts of the body, while now it is not only possible but much to be preferred on account of the superior results attained. This is due no doubt to the better apparatus now obtainable—not only tubes, but coils and interrupters. In securing these improved results with tubes of comparatively low vacuum, we are encouraged to think that the day is not far distant when it will be possible to demonstrate the presence of the softer growths, and to discriminate between soft tissues of different densities. It is well known that the lower the vacuum in the tube the more easy is it to show the lesser differences between adjacent masses of varying densities.

One reason for the better class of work turned out during the past year has been the supply of improved X-ray photographic plates. Early in the year Ilford, Ltd., placed on the market what is, in our opinion, quite the best X-ray plate yet obtainable. This opinion is based on an experience gained through the use of several thousand plates of all sizes. They are better than those of foreign make, and it is a great comfort not only to find a heavy stock ready for delivery at a moment's notice, but also to feel that we are independent of foreign manufacturers and the inevitable uncertainty of supply.

As an instance of the rapid changes which take place in a new science of this kind, we may remind our readers that at the time of writing this section for the previous volume the orthodiagraph was dealt with at some length as being the last word in the matter of accurate delineation of the heart and great vessels. Since then, thanks to the work of Groedel, of Nauheim, a system of *Teleradiography* has been developed which, from the many advantages it gives, has relegated the cumbersome, complicated, and expensive orthodiagraph to the museum of medical antiquities—useful in its day—a very short one—but now obsolete. Incidentally this new modification of radiography renders it possible to take practically instantaneous exposures of from $\frac{1}{50}$th to $\frac{1}{5}$th second with the tube at the usual distance from the plate. Of course the taking of instantaneous radiographs is by no means new, Macintyre, of Glasgow, having obtained excellent results some years ago, but the procedure then adopted was not practicable for every-day use. Owing to the great importance of this new development a brief description of the whole seems to be called for. It is necessary to have

available a continuous current, from the main or a large dynamo, of at least 100 volts pressure, and higher voltages up to 240 volts are useful. As at present constructed, mercury breaks are unsuitable, as they cannot pass the large currents required to energise the coil: an electrolytic break must be employed, and one specially constructed for this particular class of work (*Fig. 8*). It will be seen to have at least three anodes, each of which is separately adjusted so as to pass about twenty ampères through the coil. This having been done, they are all joined in parallel so that when the current is turned on some sixty ampères flow through the primary circuit. A 16-in. coil is to be preferred, but if smaller ones are used longer exposures are necessary. Anything smaller than the 12-in. size is not of much service. The coil

must be provided with a variable self-induction, and should be so proportioned as regards its primary and secondary windings that the amount of inverse current in the latter is kept very low. On this account many of the so-called "heavy discharge" coils are not suitable. With such, at least two valve tubes are necessary, and these, acting as a resistance, prevent the X-ray tube giving its full output. It is hardly necessary to point out that none but the very best quality of coils will stand this strain, and before subjecting their coils to it, experimenters are advised to get some assurance from the maker that it will be reasonably safe to do so. In the secondary circuit one valve tube, capable of passing heavy currents, is necessary, since every coil, no matter how well-proportioned in its various parts, is bound to generate some inverse current, and this is the more marked when using

a high voltage in the primary circuit—but a coil which requires at least two value tubes in series to suppress this inverse current should not be employed, as it will be found difficult or impossible to obtain good results under such circumstances.

Ordinary light-anode tubes are quite useless, as also are all types of tubes with water-cooled anodes, though for a different reason. The former have too little metal to absorb the heat generated, while the latter boil the water behind the anode so rapidly that it almost instantly ceases to act as a cooling agent. Tubes constructed with anodes of a solid mass of good heat-conducting metal are alone admissible, and so far the one which has given the best results is made by Gundelach. In some so-called "heavy-anode" tubes the anode, while massive in appearance, is found on examination to be more or less *hollow*—for what reason it is difficult to say, except that a tube with such an anode may be more easy to exhaust. These are quite unsuitable, and become useless after a very few exposures.

The vacuum of the tube must be carefully adjusted, and those with a palladium osmo-regulator will be found to be the most convenient, since heating with a wax vesta or small spirit lamp for a few seconds is ample to reduce the vacuum of the hardest tube.

Some form of *penetrometer* is required, and in our experience that of Wehnelt is to be recommended. With this instrument the tube should register 9 on the scale to get the best results.

Another necessity for successful teleradiography is an intensifying screen. No doubt in time we shall be able to do without this, but at present it is quite necessary. Except for the slight inconvenience of putting them in with the plate, there can be no objection to using those that are now to be obtained from Mr. Schall. These are entirely free from grain, and reduce the necessary exposure to about one-fifth of what it would be without.

The exposure can be made fairly correctly, after a little practice, with an ordinary double-pole knife switch, but it should be a good one, not flimsily constructed, and is all the better for having a long blade, so as to get a good distance, say four inches or more, between the contacts, also an insulating bridge, to prevent the arc being established between the positive and negative sides.

For doing instantaneous exposures with the tube at the ordinary distance from the plate, it is advisable to have an automatic and adjustable time switch, which enables one to give any exposure desired from $\frac{1}{50}$ second up to 1 second. These are rather expensive, however—about £15,—but there is reason to suppose that very soon an equally useful switch will be available costing about one-third of this. Some are so arranged that the break takes place in a strong magnetic field, which has the effect of blowing out the arc almost instantly. Such a switch can be used almost indefinitely without the contacts becoming damaged through the burning action of the arc.

Such are the modifications necessary for successful teleradiography, and its value in diagnosis can be readily seen from an inspection of

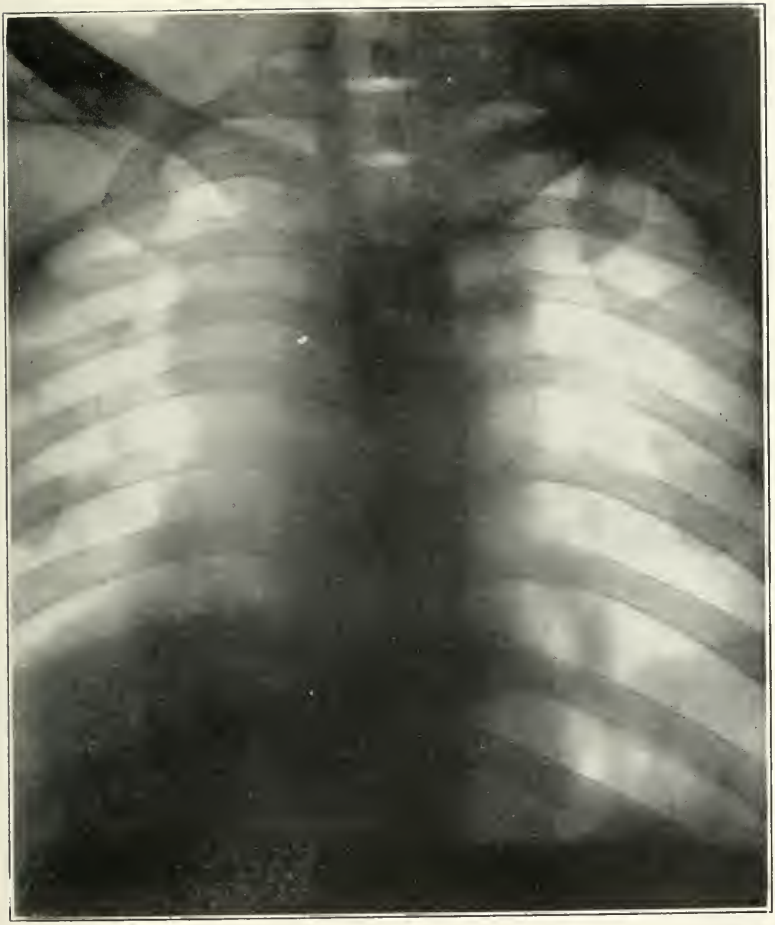
the accompanying illustrations (*Plates I and II*). The ordinary radiographs were made with the anode of the tube twenty inches, and the teleradiographs eighty inches, from the plate. The greater clearness and accuracy of the teleradiographs is most obvious and striking. While, no doubt, all makers of X-ray apparatus will soon be supplying outfits for teleradiography, it is only fair to state that it has been first introduced into this country by Mr. K. Schall, and that it was in his laboratories that the technical details were worked out.

On the subject of short exposures in radiography we are pleased to refer to a paper by Lake Hope[1] as an indication of the fact that the methods, described by us two years ago after a visit to America, are really taking hold in this country. His methods are essentially the same as we observed, and he shows that for short exposures we must pay due attention to every step in the process, from the management of the primary current to the final development and fixing of the plate.

With regard to localization, the stereoscopical method still holds the field for all ordinary purposes. Bailey[2] describes a scheme which is very useful where it is important to save time. His plan "is based on the principle that an upright thin plane, illuminated vertically from below, gives a linear shadow. If the illuminant be moved to a position on the same horizontal plane as it originally occupied and at right angles to the plane examined, then the shadow of the original thin plane becomes a figure bearing a certain definite relation to the plane, and the parts of the shadow also bear a proportionate relation to the corresponding parts of the plane under examination." The plan is easily carried out, as is shown in the paper, while the writer also gives some useful hints of a practical nature.

It is a noticeable fact that in recent years there has been a great decline in papers relating to X-ray diagnosis in surgical cases, while those bearing on medical diagnosis show a remarkable increase. It would seem that, while it is impossible to draw a hard and fast line between medical and surgical cases, we have reached almost the limits of our usefulness in the latter class, while we are making great progress as regards the former. It is no doubt in the experience of every X-ray worker that he is being more and more called upon by the physician for assistance in the diagnosis of doubtful cases, which may be taken as evidence both of a growing recognition on their part of the valuable help to be obtained in that way, and also as a tribute to the higher standard of work we are in a position to supply. Until quite recently the only cases we were asked to help with were almost entirely thoracic. We shall see later on that some very good work is now being done in abdominal cases as well.

In **Pulmonary Diseases** X rays have been on their trial as an aid to diagnosis for some time, and this subject was well discussed in the Electrotherapeutical Section of the Royal Society of Medicine in November last. From the paper by Stanley Green[4] and the discussion afterwards, the conclusions were that except to those few specialists whose skill in percussion, auscultation, etc., has reached the highest



Ordinary Radiograph.—Aneurysm of Arch of Aorta. Tube 20 in. from plate, exposure 1 minute. Note magnification of aneurysmal shadow owing to close proximity of tube.

X RAY DIAGNOSIS

Edinburgh Graph. Stereoscopic radiograph of the [illegible] plate, [illegible] second. [illegible]

degree of perfection and accuracy not likely to be attained by the average practitioner, the X rays can demonstrate the presence of early phthisis, for example, before one can be quite sure from an examination in the ordinary way. Furthermore, in these cases, the question of sanatorium treatment is bound to arise, and all know how difficult it is to induce a patient who has a business to attend to, to make up his or her mind to go away while the case is in the easily curable stage. Under such conditions a good radiograph showing unmistakable signs of pulmonary mischief will do more to persuade them of the folly of delay than anything else. Teleradiography is much superior to the ordinary method for all these cases of thoracic disease. It shows the various parts, as well as the lesions, in their true size and relationship, and should always be employed if available.

The dark tent is being increasingly employed for investigating thoracic and abdominal cases, and where the digestive tract is at fault an emulsion of carbonate of bismuth forms a very useful indicator. The taking of these massive doses of bismuth seems to have no deleterious effect on adults: at least, we have come across no evidence of any harm resulting after observing its administration in some hundreds of cases. As, however, poisoning has occurred in two infants when the *nitrate* of bismuth was used, it should not be given in the case of young children. As the oxychloride of bismuth is said to be quite inert, this salt should be always employed. Two cases of **Stricture of the Œsophagus** examined in this way are described by Dawson,[1] in a very instructive article. Follasse,[5] in a contribution to the X-ray diagnosis of **Hourglass Stomach,** gives three cases in which a radiogram made a diagnosis possible—the usual bismuth meal being used as an indicator. The possibility of being misled by the X-ray picture is pointed out in a fourth case which is described.

Groedel[6] has contributed a valuable paper on **Gastroptosis** and **Pyloroptosis,** which can be shown by X rays. These observations were made in the course of an enquiry into the shape of the normal stomach while standing and lying down. His experience goes to show that the normal stomach nearly always assumes the shape of a hook after the patient has taken a bismuth meal. In atonic conditions the weight of the food dilates the lower part, and as it is unable to empty itself in the proper time the upper part becomes dilated with gas, giving rise to a feeling of "pressure." The effect of tight lacing is very clearly shown. With the closely-drawn corset in position the stomach is unable to rise owing to the diaphragm. It must therefore go down, stretching the descending portion to a great length, so that ultimately the stomach comes to resemble two funnels with their narrow ends adjacent to each other. The paper is a very useful one, and will well repay closer study.

Hertz[7] has studied **Constipation** by means of the X rays with good result. He gives reasons for not using the bismuth salts ordinarily employed, and advises the use of bismuth oxychloride, which is quite inert and has no chemical action in the digestive tube. By the Röntgen

rays and bismuth, he was able to ascertain just where the intestinal contents were delayed, thus obtaining a definite knowledge of the cause of the constipation, which naturally indicated the treatment to be followed.

In the diagnosis of obscure **Abdominal Disease** the X rays are more and more employed. Goldmann[8] has shown how very easily the abdominal cavity can be explored by X rays provided one first distends the colon with air. In this way he has been able to demonstrate the presence of subphrenic abscess, carcinoma of the intestine, etc. The patient must be prepared by giving an aperient the night before and a thorough lavage of the colon after the aperient has acted.

Sir W. Bennett[9] has strongly emphasized the value of X rays in **Appendicitis** and other abdominal conditions in a recent paper, and the conclusion he comes to ought to be firmly fixed in the mind of every member of the medical profession:—"I have no hesitation in saying that in cases of abdominal pain or discomfort, unless the diagnosis is obvious, no examination is complete which does not include the use of the X rays, and that the practitioner is failing in his duty to his patient, especially if an exploratory operation is contemplated, who does not in such cases employ the X rays when they are available, unless the delay involved in obtaining the necessary investigator be detrimental to the patient's safety." After such an expression of opinion by one not interested in practical skiagraphy himself, who can say that the examination of any case of thoracic or abdominal disease is quite complete if a good radiograph has not been made?

A valuable paper by Morton[10] gives some diagrams of normal and abnormal stomachs which are very instructive.

The X-ray diagnosis of **Urinary Calculi** continues to be a subject of surpassing interest to all practical radiographers. A paper by Orton[11] should be carefully studied, and also one by Cole.[12] Both of these are rich in practical information of great value to radiographers.

Rieder and Kästle[13] refer to the present position and future prospects of X-ray diagnosis, and incidentally make a comparison between the orthodiagraph and teleradiography. The comparison loses some of its value when we find them saying that a teleradiograph exposure requires *fifteen seconds*—the average at present is *one* second. Experiments made by them prove that the teleradiograph is every bit as reliable as the orthodiagraph and completely satisfactory for all practical purposes.

REFERENCES.—[1]*Jour. Röntgen Soc.* May, 1908; [2]*Brit. Med. Jour.* Nov. 2, 1907; [3]*Trans. Roy. Soc. Med.* 1907; [4]*Lancet*, Oct. 26, 1907; [5]*Centb. f. inn. Med.* Mar. 7, 1908; [6]*Berl. klin. Woch.* Ap. 13, 1908; [7]*Archiv. Roentgen Ray*, June, 1908; [8]*Trans. Roy. Soc. Med.* 1907; [9]*Lancet*, May 23, 1908; [10]*Ibid.* July 25, 1908; [11]*Trans. Roy. Soc. Med.* Nov. 1907; [12]*N.Y. Med. Jour.* Ap. 25, 1908; [13]*Münch. med. Woch.* Feb. 25, 1908.

X-RAY THERAPEUTICS.

There would seem to be a considerable falling off in the number of papers dealing with X-ray treatment during the past year. This may be due to the fact that we are approaching the limits of the field of

usefulness of this agent in therapeutics. The number of new conditions in which it might be tried with more or less success is bound to be less each year, and our knowledge of its value as a therapeutic agent concurrently more nearly approaches completion. The use of X rays in the treatment of disease has settled down to a well-defined position; but to claim anything approaching finality in this, as in anything else, would be most unwise, the more so when we come to peruse a paper by Crane,[1] whose observations, though as yet based on a small number of experiments, give much cause for reflection. Reasoning by analogy, it occurred to him that "the therapeutic properties of the X-rays might lie in some power to stimulate the production of opsonins in general in the body fluids." Working on these lines he used his X-ray exposures as one would the injection of opsonins, and so brought about an immunity to the particular germ involved in the case. He gave X-ray exposures so long as they were followed by a rise in the opsonic index, but if the index fell no exposures were admissible during this negative phase. He is satisfied that the reason some cases of a given disease do well, and others not, is that in the former the treatments took place during the positive and in the latter during a negative phase, which experience shows to be worse than useless. He concludes by suggesting:—

"1. That all X-ray treatments, to be effectual, may require a degree of intensity sufficient to set free in the tissues what is equivalent to an autogenous vaccination.

"2. That the duration of the exposure and the extent of the diseased tissue exposed should be so regulated as to induce either a small negative phase or none at all.

"3. That the repetition of exposures, as far as possible, should be governed by the duration of the negative and positive phases; and that in diseases of which the disease-producing agent is as yet undetermined, one should be governed by analogy with those cases in which opsonic estimations can be made.

"It follows as a corollary that it is not necessary to expose the whole area in order to bring about complete recovery, and that exposure should not, as a rule, be repeated oftener than twice a week, and probably at less frequent intervals, to produce the maximum results and avoid prolonged or incurable negative phases. It is also increasingly necessary to measure our X-ray dosage. In this respect X-ray therapeutics is lacking in precision. No method has yet been made practicable by which we may exactly specify the quality and quantity of the X-ray dose.

"The advantage of X-ray treatments over opsonic therapeutics is considerable:—

"1. The immunizing substance set free under the influence of the X rays is of necessity autogenous; that is, it is formed from the actual microbic strain which is producing the disease. One has only to read Wright's articles to learn how important it is in opsonic practice

to use a vaccine made of the bacteria from the patient rather than from a stock culture.

"2. Many of the difficulties and mistakes incident to a bacteriological diagnosis are eliminated.

"3. In cases in which the bacteriological cause is as yet undetermined, or in which the disease-producing agents are not bacteria, the X rays are nevertheless applicable.

"I am well aware that I have carried my deductions and conclusions far beyond the limits warranted by the number of cases I have to report. My excuse is in the hope that other workers may be invited into what has seemed to me a fertile field of therapeutic endeavour."

A valuable contribution to the study of the action of the X-rays in **Lymphadenoma** is published by Michell Clarke.[2] The case was under observation for two years, when the patient contracted pneumonia and died two days after admission. The whole clinical history, treatment, and post-mortem appearances are minutely described, and in his comments he says :—

"This case presents several points of interest. The first is the striking and speedy effect of the X-rays on the glandular enlargements, which rapidly decreased under their use. On the other hand, although the glands ceased to be visible, they could still be felt as small, firm nodules, in the same condition as found at the post-mortem examination. The post-mortem findings show that, although the glands had thus decreased, the essential change of lymphadenoma—that is to say, the presence of the endothelioid and giant cells—was not done away with, and presumably, therefore, there might at any time be a recrudescence of the disease. Further, the beneficial effect of the X rays had not hindered the spread of the disease to the internal organs and the development of the characteristic nodules in the liver and spleen, although neither of these organs attained the large size sometimes met with in this disease, the spleen being only slightly enlarged. This latter fact may be due to the peculiar degeneration which had occurred in this organ. Although hyaline degeneration is known to occur in lymphadenoma, it is, I believe, not seen to anything like the extent in this case, and it is possible that the X rays may have induced the peculiar and extensive degeneration present in the glands and spleen. I have called it hyaline because of its appearance, and because it gave none of the reactions for waxy disease, all of which were carefully tried, except that the spleen stained slightly with iodine at the post-mortem examination.

"That the X rays had not got rid of the cells peculiar to lymphadenoma, although their number must have been enormously reduced *pari passu* with the decrease in size of the glands, is an interesting point in connection with their action in leukæmia, in which a great destruction of leucocytes is produced by them. It seems, however, in several of the most carefully reported cases of leukæmia that the myelocytes never entirely disappeared from the blood, and it is not yet established that the X rays cure leukæmia, although they

undoubtedly relieve it. . . . There is another point about the case in connection with the chronic glomerulo-nephritis from which the boy suffered. At the time that the X-ray treatment was begun, so much was not known as to their action on the kidneys, and the danger of producing a parenchymatous nephritis; with our present knowledge I should hardly have ventured to use them. Fearing, however, at the time that X rays might have some prejudicial effect in view of the kidney lesion, careful observations were made upon the urine, and, as no difference at all appeared in it, the treatment was continued. The post-mortem examination showed no change in the kidneys which could be attributed to the X rays, the lesions found being those consecutive to a mild scarlatinal nephritis, together with those incidental to death from pneumonia. . . . It is interesting to note that apparently no aggravation of the original affection of the kidney occurred, and generally that the same severe symptoms have not been generally observed in lymphadenoma as in leukæmia—possibly because there is usually no, or only a slight, excess of leucocytes in the circulating blood, and that the cells in the lymph-glands only undergo a gradual or slow destruction by the X rays, so that the products of their destruction only pass slowly into the blood, whereas in leukæmia a large number of cells are suddenly destroyed in the blood-stream. The X rays undoubtedly had a remarkable effect in causing the practical disappearance of the glandular tumours; whether there was any real curative effect on the disease is doubtful, considering the condition of the liver and spleen which was found post mortem. If we may regard the peculiar cells found in the lesions of lymph adenoma as the expression of the reaction of the tissues to the exciting cause of the disease—whatever that may be—this question must be answered in the negative, as although they must have been reduced in number with the reduction of the glands, they were there in characteristic form. As to their effect on the duration of the disease, this case affords no guide."

With regard to the value of X-ray treatment in **Malignant Disease,** opinions are of course divided; but before any one takes it upon himself to dismiss the subject with perhaps some contemptuous remark, let him remember that in the first place it is only when the case has become inoperable that it is handed over to the radiologist, and also that practically every one of the latter class who has had a large experience in treating such cases can quote at least one instance in which excellent results have been obtained, even when the case seemed to be quite hopeless as regards any probable amelioration of the conditions. Probably no class of medical or surgical work is more disheartening and depressing than that of dealing with a large number of inoperable cases of malignant disease such as one gets in the X-ray department of a large hospital, and yet every now and then a case singles itself out from the others in that it responds favourably to the treatment and becomes symptomatically cured. Once the surgeon has pronounced a case to be inoperable, the patient is in a

well-nigh hopeless position; but though the X-rays do not shine brilliantly in statistical tables regarding the treatment of these cases, the method is better than any other at present known, and no patient should be denied such benefit as it may give. This is not merely an expression of a pious opinion: it is a conclusion based on sufficient evidence. There would seem to be a tendency during the last year or two to refrain from advising X-ray treatment in such cases. We are convinced that this is not in the best interest of the patient. The probability of X-ray treatment doing much good is admittedly small, but it is worth striving for, for a time at least.

A paper by Pfahler[3] is very encouraging as regards **Sarcoma**, and should be referred to by any one who wishes to get a good idea of the present position of the subject. It would appear from this paper that the technique of the application does not always receive that care and attention which are necessary to ensure a probability of success. His conclusions are worthy of note: "(1) Röntgen-ray treatment of sarcoma has in the past been confined to inoperable and rapidly recurrent sarcomata. In other words, it has been practically confined to the treatment of hopeless cases, and therefore the results obtained are marvellous. (2) It can be recommended in all inoperable cases, but the more extensive the disease, the less likely are we to obtain a complete recovery. (3) In operable cases, the rays should be used before and after operation. In each case, there should be a consultation between the surgeon and the röntgenologist. (4) The freedom from recurrence is surely greater than that obtained from any other form of treatment in the same class of hopeless cases. Some of these cases have remained well from three to four years after cessation of treatment. (5) Much will depend upon careful technique, and skilful application of the rays."

With regard to **Epithelioma**, by far the most important contribution of the year is by Schiff,[4] Professor of Radiology at the University of Vienna. It is a very complete review of the whole subject, with a full bibliography, and concludes: "(1) The favourable effect of Röntgen rays on epithelioma is indisputable. (2) The treatment must not, however, be considered in a category by itself; it must rather be looked upon as an alternative or as an addition to treatment by other methods. (3) There are obviously biological differences in the various kinds of epithelioma which have not so far been sufficiently explained pathologically and anatomically, and on which the success of the Röntgen treatment is dependent. (4) To aid the effect produced by the Röntgen treatment, small operations may be done and the cautery applied according to the nature of the case. (5) In those cases in which no favourable influence is produced by the Röntgen rays, at the latest after the fourth or fifth sitting, this treatment must be discontinued. (6) The intervals between the single sittings must not be too long; a more active Röntgen light (medium soft tube) with, of course, a careful covering of the healthy parts of the skin, is to be recommended. (7) In the case of surgical operations a subsequent application of rays is

eventually desirable. (8) It is of especial importance to lay stress on the fact that by the application of Röntgen rays the patient is saved from an operation, and the result produced by the Röntgen treatment is not only equally good as regards the cure, but much better as regards the subsequent appearance."

Schiff has touched upon a very important point in number three of the above conclusions. It is certainly most difficult to explain why some cases of any given form of malignant disease respond readily and favourably to X-ray treatment, while other similar cases, so far as any one can tell, receive no good at all. This would seem to indicate that there is very much yet to learn in new and unforeseen directions regarding malignant growths. Perhaps some light may come from the direction indicated in the paper by Crane quoted above.

Béclere[5] also read an excellent treatise on the X-ray treatment of malignant tumours before the Congrès Français de Chirurgie, and it forms with the discussion a very good review of the subject.

Pusey[6] has given his experience with the X ray in 111 cases of epithelioma treated more than three years ago. Of this number 80 patients are either well to-day or have died from other causes, without recurrence of the epithelioma. Eight are dead from other diseases, one has been well over six years, 11 are well over five years, 22 over four years, 32 over three years, and 6 were living more than three years, but have since been lost trace of. Two patients are counted as practically cured. One of these died of pneumonia fifteen months after treatment, with a minute, suspicious-looking spot remaining unhealed. In the other there is a small non-progressing ulcer, resembling an X-ray burn, remaining. In both cases the original disease was very extensive. Seventeen patients are classed as only distinctly benefited ; that is, the disease was checked and life prolonged with comfort for at least a year, except in one case in which the patient, a man over 80, died within the year. All of these cases were recurrences after surgical removal of the growth, and hopeless as regards other treatment. In only 12 out of the whole number was the treatment counted a failure, though in several of these some benefit was afforded. Counting all the 31, however, which are classed as not entirely successful or as failures, there remain 80 cures out of the 111, or 72 per cent, a showing which Pusey thinks will equal that afforded by any other method of treatment.

These results are of course very excellent, but in all probability the majority are cutaneous epithelioma, which condition is as common in America as rodent ulcer is in England. Cutaneous cancer is a very favourable type of case for X-ray treatment, but whatever the nature of the cases, the above record is a very creditable one.

Paoli[7] reports two cases of **Tubercular Periostitis** cured by X rays.

Noire[8] describes what he considers a safe method of treating **Hypertrichosis** by means of X rays. He interposes between the tube and the skin a sheet of aluminium ·4 mm. thick, which absorbs the whole of the radiations which are sufficiently superficial to be lost in

the skin without reaching the hair papilla, whilst it will permit the passage of the more penetrating rays which are capable of acting upon the hair papilla and the deep part of the skin.

Boggs[9] has given us his views on "Post-operative X-ray Treatment of Malignant Disease." The chief point he makes is that the irradiation should be intense and thorough, and he is convinced that such treatment has a very great influence in postponing or obviating recurrence. The use of X rays immediately after operation for malignant disease is not carried out nearly so much as it should be.

Hunter[10] has recorded a very good result in X-ray treatment of a case of **Enlarged Prostate.** At the commencement of treatment the patient could only pass ½ oz. of urine at a time, and there was about 60 cms. of residual urine. About ten exposures were given with an old, well-seasoned tube within a period of four months, at which time he was symptomatically well. The urine was clear and sweet, and the residual was reduced to 15 cms. Examination per rectum showed the prostate to be only moderately enlarged and the testicles markedly atrophied. He considers it very inadvisable to irradiate the prostate through a rectal speculum owing to the susceptibility of the mucous membrane to an X-ray burn. It is better to apply it through the perineum, and in old men to have the testicles exposed to the rays. This causes their atrophy and has the same good effect on the prostatic condition that is sometimes produced by castration.

There have not been many papers on the X-ray treatment of **Leukæmia.** Experience has shown, and it is generally admitted, that X-ray treatment can and does reduce the excess of leucocytes in a very marked degree, but curiously enough it does not prolong the life of the patient to any appreciable extent. Stengel and Pancoast[11] consider it inadvisable to attack the spleen first. Their method is described as follows:—

"In any method of applying the treatment to the bone-marrow the body should first be divided into definite regions, and each of these should be exposed with regularity. The manner in which they have mapped out the areas for exposure is as follows: (1) The feet, ankles, and lower halves of the legs; (2) From the middle of the legs to the middle of the thighs; (3) The right half of the abdomen and pelvis and the upper half of the right thigh; (4) The corresponding area on the left side, carefully avoiding the spleen in the earlier applications, but including its lower half later on; (5) The right half of the thorax and the right shoulder, including as much of the upper extremity as possible; (6) The corresponding area of the left side, again avoiding the spleen early, but including its upper half later on; (7) Later in the treatment the entire thorax and both shoulders are often included in one application, making the proper correction in time for the increase in distance. In stout subjects it may be advisable to treat this part of the body posteriorly as well; (8) When it is safe to expose the entire spleen it is advisable to approach it from the back, and thus include the lumbar spine and the posterior aspect of the pelvis. Each

of these regions is treated in rotation and receives three successive exposures. In direct contrast to the older method of directly exposing the spleen from the start, their experience has demonstrated that this is an unwise procedure. This does not mean that the spleen should never be exposed, but it should not be attempted while the organ is still very large and the leucocytosis high. It is best to wait until the count is materially reduced and the general condition has improved. This mass of lymphatic tissue is far too susceptible to X-ray influence, and the patient is not in a condition at first to stand the strain imposed by its exposure. Although this treatment requires a much longer time, the misleading tendency of a comparatively quick symptomatic cure, such as follows direct splenic exposures, is avoided. Applications confined mainly to the spleen reduce the size of that organ, destroy the leucocytes in the circulation, including the myelocytes, and possibly have some inhibitory influence, secondarily, on the cause, and hold the disease in check, leading to an impression that the case is cured, whereas statistics show that this is seldom the case. Applications to the bone-marrow also reduce the size of the spleen and destroy the leucocytes circulating in the blood; but, in addition, they are more likely to reach and remove the cause of the disease. The spleen should be exposed at some time, but never until it is considerably reduced in size and the patient's general condition is markedly improved, and even then it should be done with caution. The proper time to stop treatment is still a somewhat uncertain question. The frequency of the applications should not be lessened until the general condition is normal and the size of the spleen and the leucocyte count nearly so. It would seem wiser to stop gradually rather than abruptly."

We have given a more or less complete description of what these experimenters suggest, as it is not at all improbable that a more gradual and gentle course of treatment might be attended with better results. There is no question about the deleterious influence of a too vigorous irradiation, the patient becoming prostrated with the absorption of an excessive dose of toxins.

Tomkinson[12] has contributed a valuable paper on X rays in the treatment of **Cutaneous Tuberculosis.** His method is one in which he employs caustics, etc., in conjunction with X rays, and it has been very satisfactory in his hands, particularly for patients who could not afford the time and expense of a course of Finsen treatment.

Lawrence[13] has devised an *X-ray bath*, in which he treats the whole body at once, for cases of general **Eczema,** etc. He uses six tubes and six coils, and while no doubt it does all he claims for it, it is too elaborate and expensive for all but the very busy dermatologist.

References.—[1]*Amer. Jour. Med. Sci.* Mar. 1908; [2]*Brit. Med. Jour.* Oct. 26, 1907; [3]*N. Y. Med. Jour.* Dec. 14, 1907; [4]*Lancet*, Nov. 23, 1907; [5]*Rev. de Chir.* Nov. 10, 1907; [6]*Med. Rec.* Jan. 18, 1908; [7]*Clinica Moderna*, Nov. 13, 1907; [8]*Brit. Med. Jour.* Oct. 24, 1908; [9]*Ann. Surg.* Feb. 1908; [10]*Amer. Jour. Med. Sci.* Jan. 1908; [11]*N. Y. Med. Jour.* May 2, 1908; [12]*Pract.* June, 1908; [13]*Jour. Cutan. Dis.* June, 1908.

Part II. The Dictionary of Treatment.

A REVIEW OF MEDICAL AND SURGICAL PROGRESS

FOR 1908. BY MANY CONTRIBUTORS.

Together with a brief Synopsis of Treatment recommended during recent years.

GENERAL REVIEW.

ACUTE INFECTIOUS DISEASES.—The most important work done recently in connection with these diseases, exclusive of those which are confined to tropical regions, is the investigation of the infectivity of patients who have recovered from an attack of typhoid fever, and of those who are brought into contact with them but have not actually suffered from the disease. These cases have been termed "carriers," and it is highly probable that continued observation will throw much light on outbreaks of typhoid fever, of which the cause is obscure or not discovered. In the article on typhoid fever will be found an account of the most recent researches on this subject.—[F. W. G.]

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ALBUMINURIA.—Prof. Sondern of New York has made it clear that albumin and casts may be found in the urine of children without the existence of disease of the kidney. He contributes an important article on the subject to this volume.—[ED. *M. J.*]

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DISEASES OF CHILDREN.—In connection with the feeding of infants the most important recent innovation is the use of artificially soured milk. It is too early to state positively what value this new method of feeding may have, but it is quite clear that in some ways it has advantages which cannot be claimed for buttermilk, the nearest approach to sour milk which has been in use hitherto. Buttermilk varies greatly in its composition, and at best contains usually but little fat. Its bacterial contents are very uncertain: it usually contains in addition to the lactic acid bacillus various other micro-organisms which are not desirable. The artificially soured milk, on the other hand, is made with whole milk, and no fat is abstracted in the process; moreover, a pure growth of the desired lactic acid bacillus is introduced without concomitant bacteria of undetermined varieties. This so-called lactacid milk has been found of value in curd indigestion in fermentative

diarrhœa, and in specific infections of the intestine with typhoid or tubercle bacilli. Dried milk has recently come much into use in the treatment of infantile marasmus and other conditions in which nutrition is difficult.

In the treatment of chorea some of the newer hypnotics, notably chloretone and trional, are now being used with a certain degree of success.

The etiology of summer diarrhœa is still a bone of contention, but there is an increasing belief that the common house-fly plays an important part in conveying the infection both to breast- and hand-fed infants.

The part played by the *Spirochæta pallida* in producing congenital syphilis, is becoming more defined and confirmed, but at present it has not altered the methods of treatment; in spite of the introduction of various powerful arsenical preparations, such as atoxyl and soamin, there seems to be no reason for discarding the mercury and iodide which have served so well in the past.—[G. F. S.]

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Nervous Diseases.—A considerable amount of work has been done which throws fresh light on the pathology of acute anterior poliomyelitis. Attention has also been drawn to the treatment of trigeminal neuralgia by Schlösser's method of deep alcohol injections into the nerve-trunks as they emerge from the base of the skull. Freud's psycho-analytic method of treating hysteria is described; whilst advances have also been made in the treatment of hysterical aphonia, chorea, facial hemispasm, and other maladies.—[P. S.]

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Dermatology.—The most important advances in English dermatology during the past year have been found in the contributions to the Dermatological Section of the British Medical Association. Ionization, which was alluded to last year, has been extended and tested in many skin diseases, and good results have been obtained in the treatment of warts, trophic ulcer, lupus erythematosus, rodent ulcer, lupus vulgaris, etc.

The vaccine method of treating many skin diseases, as expounded by Sir A. E. Wright, has been progressively extended. Acne vulgaris leprosy, and erysipelas have thus been successfully dealt with.

Carbonic snow (carbonic acid gas congealed by cold under pressure) has been recommended in the treatment of lupus erythematosus in the United States, as preferable to liquid air, and more easily handled and kept.

The urgent advisability of excision of the hard chancre, wherever this is possible, has been demonstrated by Neisser[1] and endorsed by Morris.

Some relatively less toxic preparations of arsenic which are stated to be an improvement upon atoxyl have been tested, notably

the acetyl-atoxyl of Ehrlich. These should prove useful as substitutes for arsenic given by the mouth in such diseases as psoriasis, dermatitis herpetiformis, and lichen planus, in which the dosage has often to be prolonged.—[E. G. L.]

* * * * *

Tropical Medicine.—The subject which perhaps most engages the minds of investigators is that of the treatment of sleeping sickness. A host of works have been published on this question, dealing mainly of course with the treatment of experimental infections in animals. The records of treatment of cases of human trypanosomiasis are comparatively few, and experiments on a large scale since Koch's experience with atoxyl have not yet been recorded. That atoxyl is not the panacea that was imagined must perhaps be allowed, but it undoubtedly still holds the field, though in many cases it has been combined with other arsenic preparations, or with antimony or mercury. The aniline dyes in human cases have apparently not been much employed. The mode of transmission of the disease by the fly is still unsettled: many facts point to a developmental cycle, but others in just the opposite direction. It is to be hoped that the long-discussed question will at last be finally settled by the Sleeping Sickness Commission lately sent to Uganda by the Royal Society. That sleeping sickness is the main question which appeals to the Imperial authorities is shown, too, by the establishment of a Sleeping Sickness Bureau in London, the object of which is to keep medical officers informed of the latest discoveries on the subject.

In the prophylaxis of plague, the suggestion that cats are the best means of suppressing rats deserves consideration.

Two English Commissions have been at work for some time past on the subject of blackwater fever, and their results will be anxiously awaited, though the writer feels confident that the position taken up by himself and his colleague some years ago, viz., as to the malarial nature of the disease, will not be assailed. A special parasite for blackwater fever has so far been sought for in vain by all observers.

In the treatment of spirochæte fever there is little to record and the mode of transmission of several of the species of spirochætes is still unknown.—[J. W. W. S.]

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Syphilis and Gonorrhœa.—In the treatment of acute gonorrhœa, there is an increasing tendency to use the irrigation method, more especially in the early stages of the infection. A vaccine of dead gonococci has been used in gonorrhœal arthritis, and apparently recovery may be hastened by this means in chronic cases. The vaccine treatment has also been applied with some measure of success to cases of gonorrhœal vulvovaginitis in children. The ionization of silver and of zinc has been used with encouraging results in the treatment of chronic urethritis.

The discovery of the *Spirochæta pallida* as the cause of syphilis has given an impetus to the study of the pathology and treatment of this disease. Wassermann's serum reaction applied to the diagnosis of syphilis is the subject of a very large amount of writing. The value of a positive result in this examination has now become established, but a negative result is not of great value in the diagnosis of syphilis. The method is an extremely complicated one, and requires a skilled and experienced observer to carry it out.

Variations in the method of administration of mercury have been recently used by some surgeons. Thus intravenous infusion of sublimate solution has been tried, and rectal administration of mercury in the form of suppositories of grey oil, insufflations of calomel into the nose, and the wearing of a mask for the inhalation of mercury by the lungs, have recently been used. A compound of mercury and cholic acid (named mergol) has been introduced, with the idea that the mercury is passed into, and much of it is lodged in, the liver, by which this form will be easily taken up.

Following the discovery of the spirochæte as the cause of syphilis, intravenous injections of quinine, and arsenic, in the form of atoxyl by the mouth, have been used. The injection of nuclein solution to produce leucocytosis, and of uranate of ammonia, have been tried. —[J. W. T. T.]

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Throat, Ear, and Nose.—The main advances in aural surgery deal with the treatment of labyrinthine suppuration and otitic meningitis. In the former field much good work has been accomplished. The clinical researches made by Barany, of Vienna, have added considerably to the accuracy of diagnosis which is the first essential for successful treatment.

Recent pathological work has demonstrated the important rôle played by suppurative labyrinthitis in the production of otitic meningitis and abscess of the cerebellum. Hence the growing tendency to explore the cerebellum through the posterior surface of the pars petrosa between the groove of the lateral sinus and the internal auditory meatus.

The successful treatment of otitic meningitis which, in the first instance at any rate, is often a localized process, is gradually becoming an accomplished fact. The main necessity is early diagnosis, followed by prompt surgical interference, viz., the removal of the focus of disease and drainage of the subarachnoid space. The value of repeated lumbar puncture, both from a diagnostic and therapeutic standpoint, should not be lost sight of, and should be employed in all suitable cases. In addition, vaccine therapy must be held to have a place in the successful treatment of certain complicated cases.

Although no striking advance has been made in the study of diseases of the larynx, a valuable addition to the armamentarium has been made by Brüning, whose instruments for the *direct* examination of

the larynx, trachea, and bronchi are now in fairly general use. *Direct* examination of the upper and lower air-passages has proved of the greatest clinical value. The removal of foreign bodies from the air- or food-passages may now be successfully accomplished by *direct* examination, assisted at times by the X rays.

In rhinology, the tendency to open and drain infected accessory sinuses through the nose is growing. Although intranasal treatment may in many cases not be sufficient to secure a complete cure, it at least has the merit of affording better drainage than formerly, and of saving the patient from an external operation difficult to perform and too frequently uncertain in its results.

The immunization of the patient by suitable vaccines has been practised by certain observers, the vaccine employed being either a "stock" vaccine or one prepared from the patient himself. Vaccine therapy, provided it is accompanied by efficient drainage, promises to be an addition to present day methods of treatment. [W. M.]

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Ophthalmology.—Though no very striking advance in practical ophthalmology can be claimed during the past year, a number of interesting papers have been read, a few good books published, and much valuable clinical work has been recorded.

Glaucoma has been studied from its anatomical side by Mr. Henderson, while Colonel Herbert, late of the Indian Medical Service, has been working at the operative treatment of intractable forms by the production of an artificial subconjunctival fistula.

The etiology of cataract, and the action of hydrolysing ferments on the crystalline lens, have occupied the attention of some Continental investigators, whose efforts, however, so far have been more laborious than fruitful. Simple extraction is on the increase except among those who, placing safety before every other consideration, prefer preliminary iridectomy. The average operator still performs the combined extraction in most of his cases, preliminary iridectomy in those which need special care or seem peculiarly important, and simple extraction in a variable minority to whom the appearance of the eye is a consideration.

Opsonic treatment of eye affections, tuberculin injections and vaccine and serum therapy have been more largely tested in practice, and in general with a fair measure of success.

The relation of disease of the nasal accessory sinuses to diseases of the eye has commanded unusual attention, and the impression has been gleaned that these cavities are much more often impeachable for affections of the eye than ophthalmic surgeons have hitherto suspected.

Excision of the lacrymal sac has become a favourite operation with many, and certainly a very useful one when conservative methods fail. Mirror writing, metastatic affections of the chorod and retina, and the treponema pallidum in connection with interstitial keratitis have all attracted attention

Detachment of the retina, retinitis pigmentosa, senile choroiditis, sympathetic ophthalmitis, and a few other lamentable conditions still stretch out their arms for substantial help.—[E. E. M.]

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Obstetrics and Gynæcology.—The last year has been singularly unproductive in new and original work. Nevertheless, a certain number of papers stand out as of importance. The subject of uterine fibroids has been exhaustively dealt with on the basis of the collected results of an enormous number of cases submitted to operative measures. The present position of hysterectomy for these tumours has been reviewed, with conclusions eminently favourable to the operation, whilst the complications and dangers attaching to them have in another paper received full consideration.

The treatment of carcinoma of the cervix by the radical operation devised by Wertheim has been made the subject of one paper, the first detailed account of the operation which has as yet emanated from the British school of gynæcology. The authors of this paper incline very favourably to the operation, and believe that it is destined to become the only operative measure which will be carried out for the surgical cure of this disease.

The treatment of rupture of the uterus, and the causes which bring it about, have been discussed adequately in two published papers; whilst the various methods of treating uterine displacements was made the subject of a debate at the annual meeting of the British Medical Association.

On the same occasion the various ways of treating obstructed labour were critically examined and discussed by various authorities.

The relation borne by various diseases to pregnancy was made the text of the Goulstonian Lectures for this year; and, finally, much literature has accumulated around the vexed questions of the treatment of eclampsia and puerperal fever respectively.—[V. B.]

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General Surgery.—In the department of general surgery there have been no advances of any note. There was a discussion on cancer of the breast at the annual meeting of the British Medical Association, but no new methods or views were presented, the opinion of the majority of surgeons being very pronounced in favour of the modern operation. Mr. Sampson Handley explains in this issue his operation of lymphangioplasty for the removal of lymphatic obstructions.

Bier's treatment by congestion is on its trial, and although in septic conditions its judicious use has been followed by good results, opinions are divided as to its value in tuberculous cases, and though temporary relief is given in cases of chronic arthritis, no permanent improvement can be looked for.

Many workers have been devoting attention to the treatment of various conditions by vaccines and to the opsonic index as a guide

to treatment and prognosis; there is here a wide field of investigation for future exploration.

Discussions have again taken place on the operative and non-operative treatment of fractures, but except where the fracture is near the joint, the balance of opinion is in favour of non-interference in the majority of cases.—[P. L.]

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Fractures.—The treatment of fractures without immobilization is a method which appears contrary to the first principles of surgery, yet the remarkable results attained by Dr. Lucas-Championnière, at the Hôtel Dieu, Paris, are likely to revolutionize the whole teaching on the subject. We are fortunate in being able to place a full account of this distinguished surgeon's theories and methods before our readers. —[Ed. *M.A.*]

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Rectal Surgery.—Judged by the number of cases recorded, the method of excision of the rectum by what is known as the combined method (abdomino-perineal) is gaining ground with surgeons. Arbuthnot Lane suggests a method of doing the operation in two stages which presents some novel features.

Baldwin describes a method of excision which when practicable appears to be deserving of further trial.

An interesting case of spontaneous rupture of the rectum during defæcation is described by L. Burkhardt, and the statistics of this rare injury are brought up to date. Previous cases have occurred in connection with prolapse or in a healthy rectum from severe strain, as in lifting a weight, but Burkhardt's case is the first recorded in which a normal rectum gave way during defæcation.

The usual long list of prescriptions for the cure of pruritus ani is to be found in the literature of the year. Their number and variety indicate that many cases of pruritus are justly called "inveterate," and are incurable by local applications.

An easy and ingenious method of excising piles is described by Alexander Don. The piles, prolapsed in the usual way by means of catch forceps, are transfixed by needles, which penetrate a cork, covered with gauze, previously placed in the rectum. By pulling on the cork the piles are prolapsed clear of the external sphincter muscle, and a rubber cord placed tightly underneath the needles compresses the blood-vessels, so that the piles can be excised and their bases sutured bloodlessly.

The treatment of ulceration of the rectum by cataphoresis is fully discussed by F. C. Wallis and Ironside Bruce. It appears to be well worth trial in certain of these extremely intractable cases. The rationale of the treatment is that a zinc electrode surrounded by gauze soaked in 4 per cent solution of zinc sulphate is introduced into the rectum and attached to the positive pole of a battery; an indifferent

electrode moistened with water to insure contact, and attached to the negative pole, is applied to the front of the abdomen; a current of 20 ma. is passed for two minutes, then increased to 30 ma., at which it is kept for 10 minutes. The result is that the SO_4 set free at the positive pole is taken up by the zinc rod, while the zinc ions penetrate the tissues of the rectum.—[C. B. B.]

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Urinary Surgery.—The literature of the year evinces the growing tendency on the part of surgeons to adopt a more drastic treatment for cancer of the bladder and prostate. Partial resection or complete removal of the bladder and prostate is advised in the earliest recognizable stages, but it is not decided as to just how the urine should be diverted—whether by nephrostomy or ureterostomy. It need hardly be pointed out that the diagnosis of carcinoma of either organ in the very early stages frequently taxes the tactile dexterity and the clinical acumen of an expert to the utmost; therefore it will rarely happen that cases will be diagnosed sufficiently early to allow of a permanent cure being effected by operative procedure.

There is still a divided opinion as to how to treat movable kidneys wisely. The operation of anterior nephropexy, which Dr. Harlan, of Cincinnati, Ohio, in 1905, and Mr. Stanmore Bishop in 1907, separately and apparently independently urged upon the profession, is still under consideration.

The first Congress of the International Association of Urologists, which is recorded in this year's literature, bids fair to be a most important event in the progress of modern urinary surgery. Acknowledged experts from all parts of the world met in Paris at the end of September to interchange views and to discuss such difficult problems as anuria, the prostate, and tuberculosis of the kidney. The amount of practical experience recorded by individual speakers at the meetings was remarkable, and the discussions were carried on with such harmony and fine judgment, and dominated by so great a consciousness of responsibility, that these triennial meetings bid fair to exercise a most important and far-reaching influence upon the exact diagnosis and the unification of sound treatment of diseases of the urinary tract. The consensus of opinion arrived at is alluded to under the various headings.—[E. H. F.]

ABDOMEN, SURGERY OF. *Rutherford Morison, F.R.C.S.*

The position, direction, and methods of suturing incisions made in the abdominal wall have for years been fruitful subjects for discussion, and yet are of interest, because surgical opinion is not unanimous, and post-operative hernia through the scar still occasionally occurs. The linea alba has held its own, and we think justly, for its advantages are many and the disadvantages few. It is true, as Maylard points out, that its vascular and lymphatic supply are

defective, but the same may be said of the cornea and of tendon, and it is certain that in no other tissues does healing occur with greater rapidity. Hernia of an abdominal scar is a very rare event, whatever the position of the wound may be, provided each layer is separately united and some care is taken for two months after healing has occurred. The most important matter is to avoid damage to the important nerves of the abdominal wall if no weakness is to result. There are, in our opinion, only two ideal incisions possible—that in the linea alba and an oblique incision running a course parallel to that of the termination of the intercostal nerves.

Mayland[1] advocates the advantages of a transverse over the vertical incision in abdominal surgery as being less likely to lead to post-operative hernia. Two great essentials which lead to a firm cicatrix are a good blood and lymphatic network, and these are deficient in the region of the linea alba. Again, contractions of the oblique and transverse muscles of the abdominal wall tend to separate the approximated edges of the wound. Should a vertical extra-median incision be made, the aponeurosis is weakened and the nerves are cut. Through an incision made parallel to the fibres of the aponeurosis the above objections are obviated. He quotes sixteen cases of abdominal section which he operated upon through the transverse incision prior to eighteen months before; of these a hernia developed in three.

Abdominal Injuries.—There is no more difficult or responsible position than the one which calls for a decision in the case of an abdominal injury. The first question which has to be answered refers to its danger—whether it is serious or not. The answer to this question generally suffices to determine the mode of action; hence it is of the greatest importance. A trivial injury may be followed by considerable shock, a deadly hurt may produce little shock at all, and this knowledge may in obscure injuries lead to indecision and fatal delay. And how is the matter to be decided? First, perhaps, we would place the nature of the injury. Was it such as to be likely to cause serious damage? The most dangerous results are likely to follow the application of localized force, e.g., the kick of a horse, bicycling into a cart shaft, etc., and until the contrary has been proved it must be assumed that in these cases serious damage has been inflicted on the abdominal contents, even though the appearance and general condition of the patient lend no support to such a serious view. In these, indeed in every case of obscure abdominal injury, the second aid to diagnosis should be employed, viz. careful watching. Every hour till danger has passed, each symptom and sign should be noted, and an increase in any important one, especially the pulse-rate, should suggest the need for surgical aid. To wait for the development of signs of peritonitis is to court disaster; early operation is the treatment of all serious abdominal injuries.

When a wound exists in the parietes, for example a stab or gunshot, it may be clear from examination of the weapon or a knowledge of the

direction of the shot, or from protrusion of contents, that penetration of the cavity has occurred, but this evidence is not always available. In such instances the rule should be, after due preparation, to extend the wound and see whether the peritoneum has been opened or not. If it has been opened, the operation of abdominal exploration follows.

Clayton-Greene[2] discusses the difficulties which may be met with in arriving at a diagnosis. Even with a very serious internal injury shock may be absent; nor are the classical symptoms of internal hæmorrhage invariably present, especially the presence of flank dullness with a large intraperitoneal collection of blood due to ruptured liver or spleen. He lays great stress on the importance of rigidity. Early distention of the abdomen is more often associated with the rapid pouring out of blood, the distention of peritonitis taking a longer period for its development.

Abdominal injuries are classified into two main groups: (1) With a wound or laceration of some part of the abdominal or pelvic wall; (2) Where no wound is present, and even bruising and signs of local damage may be absent. In the former group there may or may not be tearing of the parietal peritoneum, and even though the serous membrane escapes, the abdominal viscera may be seriously damaged. Turning to the second group, the most important sign of intraperitoneal intestinal rupture is rigidity of a large segment of the abdomen and with an increasing area. If with this rigidity there is a gradual increase in the pulse-rate, with increasing abdominal pain, an abdominal exploration should be done in any doubtful case. Rupture of the duodenum may be intra- or extra-peritoneal. If the latter it is rarely feasible to suture up the rent, and the best that can be looked for is the development of a subphrenic abscess which can be opened and drained at a later date. The jejunal mesentery may be torn as well as the intestine; moreover, the rupture may be multiple.

Stress is laid on the importance of making a thorough examination for multiple injuries at the operation, if the patient's condition will admit. A ruptured bladder is usually a complication of a pelvic fracture, but may be met with apart from any injury to the bones. In a typical case the first symptom of a vesical injury, and one on which too much stress cannot be laid, is the desire which the patient expresses to micturate—a desire which, however, he cannot gratify. If the patient could previously micturate normally, either the bladder or urethra is ruptured, or the viscus is filled with clot. The usual shock of an abdominal injury is present, together with marked rigidity of the lower abdominal muscles. In an intraperitoneal rupture there is intense hypogastric pain; in extraperitoneal rupture the urine escapes into the space of Retzius and may form a hypogastric tumour similar to a distended bladder. He approves of the test of injecting a measured quantity of boracic acid solution and noting the non-return of an equal amount, and it is to be repeated three times. A blood-clot blocking the eye of the catheter may be a source of confusion. An intraperitoneal rupture of the kidney gives the same general signs

and symptoms as a ruptured liver or spleen; an extraperitoneal rupture results in a large swelling.

Some Points in After-treatment.—Max,[3] of Jerusalem, says in all abdominal surgery one is continually met with post-operative difficulties, more especially in those cases where it has been necessary to leave openings for drainage. Most of these troubles are due to adhesions, and to keep the intestines moving we have many methods in use. In spite of these, however, adhesions do occur, and patients return complaining of hard and painful scars, obstinate constipation, pain, etc. To relieve this the author has used Bier's artificial leech. Once every day, at first, and later every two or three days, this glass cup is laid on the cicatrix and kept there twenty to thirty minutes. It is noticed that the skin becomes red under the glass, and the patient feels a sensation of heat. After removal of the glass the pressure sense is almost nil. In from six to twenty-two sittings the hard cicatrix becomes soft, the obstinate constipation is relieved, and the discomfort disappears. He cites a number of cases in support of this method, and calls attention to some points in its application. To cause pain must be carefully avoided, and also too lax an application of the cup. The size of the cup varies with the individual needs of the patient.

J. B. Blake[4] says intraperitoneal adhesions may be produced by (1) Sepsis; (2) Destruction or complete removal of portions of the peritoneum; (3) Severe or long-continued irritation even though the irritation be occasioned by a substance originally sterile. So far as possible, surgeons scrupulously avoid these causes, and when this is impossible, endeavour to minimize their undesirable sequel: (1) By carefully covering denuded surfaces with peritoneum occasionally omental flaps or grafts; (2) By the use of Cargile membrane or similar sterile, absorbable substances; (3) By introducing salt solution, or salt solution and adrenalin, into the peritoneal cavity before closing the incision. Notwithstanding these efforts, adhesions often give trouble. To remedy this he experimented upon cats, as their peritoneum is practically the same as that of the human subject. He took a series of cats and performed a laparotomy on each. An extensive area of peritoneum was denuded in each case; in half, sterilized olive oil was introduced into the peritoneal cavity, while in the other half the belly wall was sewn up without any oil having been injected. At the autopsies made some time after, he found that although the oil does not always prevent the formation of adhesions, they were less dense and less extensive than when oil was not utilized. No harm having happened to the cats, he was justified in applying the treatment to human beings. He did so in seven cases, five being appendicitis, one a case of extensive adhesions, one a diffuse peritonitis. From 1–3 dr. of sterile oil were either poured directly into the peritoneal cavity or applied on a sponge. Five made an uneventful recovery, the case of diffuse peritonitis died, one had localized sepsis which he thinks cannot be attributed to the oil, while the remaining case still has a sinus (three years after) which has never healed. In the last

case tuberculous peritonitis was suspected as the cause of the persistent sinus.

Constructive Surgery after Gunshot Wound.—Polk[5] describes a case of a sportsman who fell while carrying a gun, the contents of both barrels entering the abdominal wall close to the left anterior superior iliac spine, and emerging behind at the level of the upper border of the left sacro-iliac joint. The peritoneal cavity was opened, exposing the sigmoid flexure, the lower pole of the left kidney, and the anterior end of the left twelfth rib. The top of the ilium was blown away, and the muscles attached to it were much lacerated. Owing to the trauma of the sigmoid, a fæcal fistula developed. At the end of four months the anterior wound in the abdominal wall had healed, though the fæcal fistula persisted, and to aid its closure an anastomosis was made between the upper surface of the sigmoid flexure and the posterior aspect of the transverse colon. The dimensions of the external wound were much diminished by approximation of its margin by plaster placed perpendicularly. At the end of twelve months fæces continued to discharge through an oval opening $3\frac{3}{4}$ in. by $2\frac{1}{2}$ in. A second operation was now performed, which consisted in separating the intestine from the surrounding wall and then closing it. The oval hole in the sigmoid flexure was sutured up transversely. Parietal peritoneum to cover the restored sigmoid was obtained by suturing the omentum around the edges of the abdominal-wall wound. This in turn was covered by flaps of skin and subcutaneous fat obtained by undercutting at either extremity of the fistula; it was impossible to obtain a muscular or fascial covering. Two years after operation he was perfectly well and able to do his work.

References.—[1]*Brit. Med. Jour.* Oct. 5, 1907; [2]*Med. Press*, July 8, 1908; [3]*Münch. med. Woch.* May 26, 1908; [4]*Surg. Gyn. and Obst.* June, 1908; [5]*Med. Rec.* Ap. 18, 1908.

ABORTION, RECURRENT.

(*Vol.* 1893, p. 64)—Italian physicians, to prevent repeated abortions in patients predisposed thereto, prescribe **Asafœtida** in $1\frac{1}{2}$-gr. pills, beginning with two daily, when pregnancy is first diagnosed, increasing to ten daily, then gradually reducing till the confinement. (*Vol.* 1903, p. 100)—When there is a history, or even a suspicion of syphilis, give **Mercury** with or without iodides. **Blaud's Pill** with **Iodides** is useful for cases with anæmia and brownish discharge during pregnancy. (*Vol.* 1904, p. 98)—Treat "strumous" cases with **Syr. Ferri Phosph. Co.** ℥j t.d.s. and **Ol. Morrhuæ** ℥j to ℥ss. t.d.s. **Potass. Chlorat.** gr. x. t.d.s. from the third month onwards is useful.

ABSCESSES, ACUTE.

Priestley Leech, M.D., F.R.C.S.

Phillips[1] advises the following method in the treatment of acute abscesses: cleanse the skin as in operating on sterile tissues; make an incision long enough to evacuate all the pus, then rub its internal surface clean and smooth with gauze wrapped round the finger: pack the abscess cavity tightly with gauze, dry, and apply a wool dressing, and bandage as firmly as possible. At the end of forty-eight hours remove the packing, and dress the wound as if it were a simple incision:

do not pack or drain at all. The dressing will only require changing once in three or four days. It will be found that the sides of the abscess cavity unite promptly, as if it were simply an incised wound that is being treated.

REFERENCE.—[1]*Brit. Med. Jour.* May 16, 1908.

ACHYLIA GASTRICA.

(*Vol.* 1904, p. 367.)—In cases of neurasthenia, as well as of atrophy of the gastric glands, repeated analyses of stomach contents may show absence of HCl and ferments. Persevering treatment with **Pepsin** and **Hydrochloric Acid** may effect a cure; in other cases **Strychnine** and **Pilocarpine** given hypodermically are useful.

ACNE VULGARIS. *E. Graham Little M.D., F.R.C.P.*

The general and constitutional treatment of acne vulgaris is too often neglected, and receives proper consideration in a paper by Sutton.[1] The author insists on care of the diet, greasy and fatty foods being prohibited, as well as gravies, cheese, pastries, hot breads, sweets, pickles, ice water, and excessive quantities of tea, coffee, and cocoa. Whole-meal bread, shredded-wheat biscuits, or vegetables sometimes prevent constipation; starchy foods must as a rule be avoided. **Nux Vomica** and **Gentian** are prescribed with advantage. Sometimes, when the glands are inactive, **Arsenic Sulphide** in doses of $\frac{1}{12}$ gr. after each meal acts as a stimulant and alterative. The comedones should be expressed daily with a suitable instrument, such as Pillard's comedo-extractor; the watch-key for this purpose is condemned. Of the local applications, lotions are more pleasant than ointments, and the following formula is recommended:

℞ Zinc. Sulphat. gr. xxx Potass. Sulphurat. āā ℥ss
Sulphur. Precip. ℥ij ad ℥iv

This mixture should be kept in a dark bottle and well shaken before use. It should be applied with a cotton swab night and morning. The more active ingredients in this mixture may be increased in the severer cases. When exfoliation has been produced by this means, rose water ointment should be applied as a sedative. In the indurated and pustular varieties, the pus sacs should be opened with a fine bistoury, the contents squeezed out, and the cavities mopped with a cotton swab dipped in pure carbolic. The face should be scrubbed with hot water and soft soap once a day. **X Rays** give brilliant results in some cases: the soft tube placed 30 to 50 cms. from the affected area for from two to five minutes two or three times weekly, being recommended. **Chromotherapy** with coloured screens enclosing a high-power incandescent lamp is specially praised: the white, red, or yellow light being used in sluggish cases, the blue, violet, or green in acute conditions.

Max Joseph[2] gives the following formulæ as useful:—

In acne indurata of the face:

℞ Sulphur. Colloid. ij Past. Lassar. ad ℥ij

This must be spread on in the evening in a layer as thin as a knife-edge,

covered with thin gauze, and a linen mask worn over; in the morning this dressing is to be removed with Rüböl and washed with warm water and sulphur soap.

In acne of the back:

R	Sulphur. Colloid.	50 grams		Sapon. Kalin.	150 grams
	Aq. Dest.	350 grams		Ol. Nerol.	5 grams

References.—[1]*Ther. Gaz.* Feb. 15, 1908; [2]*Berl. klin. Woch.* Mar. 30, 1908.

ACTINOMYCOSIS OF THE SKIN OF THE FOOT.

E. Graham Little, M.D., F.R.C.P.

Primary invasion of the skin by actinomyces is rare; it is more commonly secondary to some visceral or mucous membrane affection. Seventeen such cases are collected by Buerger,[1] including one of his own, which occurred in a Russian girl, aged 16, resident in New York City for seven years previously to the development of the disease. The earliest lesion, as is so often the case in this affection, was thought to be a tubercular inoculation; it appeared as a tiny "pimple" on the dorsum of the left foot; the red spot gradually enlarged until it formed an elliptical tumefied area 2·5 by 1·3 cm. in extent, and raised about 4 mm. above the skin; it was reddish blue or violaceous in colour; the epidermis was intact, but thinned over the swelling, which was soft to the touch—semifluctuating. There were no enlarged glands. The diseased area of skin was removed under cocaine anæsthesia, and the base curetted. There were three actinomycotic colonies in the tissue examined, which constituted the whole tumour. These colonies were embedded in connective tissue with a strikingly large number of new blood-vessels. The site and manner of inoculation could not be determined. Healing was completed in twenty-four days, under internal administration of potassium iodide.

Reference.—[1]*Amer. Jour. Med. Sci.* Nov. 1908.

ADDISON'S DISEASE.

(*Vol.* 1907, p. 232)—Batty Shaw states that treatment by **Suprarenal Extract** is of temporary value only, by virtue of its transient effect in restoring blood-pressure. He quotes a case of Short's in which this result was produced more effectively by giving **Digitalin** (Nativelle.)

ALBUMINURIA (in Children.) (*See also* Urine.)

Prof. Frederic E. Sondern, M.D., New York.

The occurrence of albumin in the urine of children, with or without the presence of casts on microscopic examination, may be due not only to an inflammatory lesion of the kidney but also to a non-inflammatory or functional renal disorder. The importance of the former is obvious, while that of the latter is twofold, namely, to differentiate it from a true nephritis as well as to aid in finding a cause for the associated clinical symptoms. The evidences presented by the urine in cases of well-marked acute or chronic nephritis are probably never simulated by those appearing in consequence of functional

or non-inflammatory renal disturbances; still the determination is not always a simple matter, and is frequently not possible by the mere knowledge of the presence or absence of albumin and casts. A complete urine analysis frequently offers additional help particularly as the functional disorders of the kidney are apt to present elements in the urine known as renal irritants, or those known to accompany renal irritants. The actual differential diagnosis of all types not immediately possible, and at best demands not only complete and repeated examination of the urine chemically and microscopically, but also the closest clinical observation by the physician.

The term albuminuria implies the presence of some albumin in the urine and to avoid confusion the occurrence of other albumins should not be called by the same name. The clinical significance of the presence of the derived albumins is still an open question; it will probably be found to be an indication of a fault in metabolism rather than an evidence of renal impairment.

Concerning the method for the detection of albumin in the urine, the variation in the opinions expressed by different authors is probably due to the fact that no single test exists which is free from error when applied in the routine analysis of a fluid so complex in composition. A consideration of this subject is not the object of this communication, but two methods of detection and differentiation should always be employed, and they should be selected so that the same error cannot occur in both with any specimen and also that the rarer forms of derived albumin should not be overlooked.

An absolutely normal kidney, with normal circulation and innervation, and which receives blood of normal quality not from toxic or irritating substances, does not excrete albumin and therefore there is no physiological albuminuria in the strict sense of the word. Smaller or larger amounts of albumin, with or without the presence of casts are found in the urine, not only in an inflammation of the renal parenchyma in its broadest sense, but also in non-inflammatory and purely functional disorders resulting from comparatively slight disturbances in circulation in innervation or in the quality of the blood offered the kidney for the exercise of its function. The differentiation of these two types demands complete analysis as well as careful clinical observation.

Inflammatory Lesions of the Kidney.—The characteristic signs noted in the urine in the different forms of nephritis to which children are subject, such as the amount of albumin and the variety of casts, in addition to the chemical and excretory changes, are matters of common knowledge to which reference seems unnecessary, but some general rules and rather unusual occurrences are noteworthy. The amount of albumin and the number and type of casts while at times significant in estimating the acuteness in a given case of nephritis when comparing repeated examinations are in general no guide to the severity of the lesion. Modern research has also demonstrated that a knowledge of the daily excretion of solids or of the daily amount of urea do not

form so accurate a basis for an opinion on the severity of the renal lesion or the degree of functional capacity as was once believed; but on the other hand, Cabot's view that such information has absolutely no value is the other extreme. Changes in a given case from day to day are certainly of interest, and probably of value, particularly when the diet remains the same, and in this connection it is well to keep in mind the normal figures of urea excretion in children, as follows:—

Children	3 to 6 years:	1 gram per kilo body-weight.
,,	8 to 11 years:	0·7 ,, ,, ,, ,, ,,
,,	13 to 16 years:	0·3 to 0·5 ,, ,, ,, ,, ,,

While the degree of albuminuria and the presence of casts are potent factors in the differential diagnosis between pyelonephritis and other suppurative conditions in the urinary tract, the balance of the complete urine analysis lends much additional weight.

An exceedingly acute nephritis, with marked diminution in the amount of urine voided, may show a large amount of albumin in the urine, with much blood and no casts at all for the first day or two. To differentiate this from a hæmaturia due to one or other cause is usually easily possible when all clinical and analytical facts are considered; but to exclude a nephritis by the absence of casts in this instance would be very misleading.

The occasional absence in the urine of albumin or of casts, or both, for longer or shorter periods in cases of chronic interstitial nephritis, especially during the quiescent period when climatic conditions are good, must be kept in mind if the condition is not to be overlooked. The changes in the chemical composition do not disappear at such time, and while these are not characteristic when occurring alone, they always justify further observation before a true renal lesion is excluded.

The occurrence of renal and vesical calculi, as well as evidences of a nephritis in the urine of the newborn, were observed by Jacobi many years ago, and are certainly interesting observations. Considerable experimental work has been done in reference to the excretion of urine by the fœtus in utero. Kreidl and Mandl conclude that under normal conditions the fœtus does not excrete urine, but on impairment of the excretory ability of the mother, the fœtus makes effort to clear its blood by renal action. It would seem a subject for fruitful clinical observation to note if the cases of renal or vesical calculi in the newborn are associated with renal impairment in the mother, as a relationship of these conditions would seem as plausible and give as much food for thought concerning prophylaxis, as the association of partial asphyxia and cerebral hæmorrhage also described by Jacobi.

Functional or Non-inflammatory Lesions of the Kidney.—The class of cases in which the albuminuria, with or without casts, is due to a functional and non-inflammatory renal disorder, forms an interesting subject for consideration at greater length. While the excretion of albumin is due directly to changes in the circulation, in the innervation

or in the composition of the blood offered the kidney for the exercise of its function, without appreciable structural change in the kidney, it is a misnomer to call this physiological albuminuria. A fault certainly exists, no matter how temporary and insignificant this may be, and the term functional albuminuria would seem more appropriate.

Sudden changes of temperature, cold baths, violent exercise, sudden changes in altitude, fright, extreme grief, surgical or traumatic shock not limited to the kidney, in fact anything that suddenly increases or lowers blood-pressure or that occasions changes in circulation or innervation may be named as causes of transitory albuminuria. In these changes the diagnosis is simple, on account of the usual short duration of the condition in question and the easy detection of the causative factor in the clinical history.

When the functional albuminuria is due to changes in the usual composition of the blood or the presence in it of toxic substances, products of faulty metabolism—in short, renal irritants—or to circulatory disturbances due to lesions of the heart or other organs, the condition is not transitory in the same sense, and these are the cases in which the differential diagnosis between functional and nephritic albuminuria becomes much more difficult. In these disorders the mere consideration of albumin and casts is not sufficient for differential diagnosis, and repeated complete analytical results, combined with careful clinical observation, are always necessary, and not invariably successful. Space does not permit an enumeration of even a large share of the different varieties of cases of this class, but attention must be directed to some of the types which are the most confusing in differential diagnosis.

The albuminuria with or without casts associated with the different types of anæmia without circulatory disturbances, and due to the changed composition of the blood only, or to the presence of a possible toxin, is often most confusing. In these cases a differentiation of the above from a quiescent nephritis and consequent anæmia, possibly ascribed to a previous infectious disease, taxes the skill of the most astute clinician and usually demands recourse to every diagnostic aid, of which the laboratory investigation forms a part only.

The albuminuria with or without casts associated with chronic circulatory disturbances, notably cardiac lesions, offers the same difficulties in differential diagnosis to a lesser degree. In these cases it is again true that the complete analytical result obtained from a urine analysis offers much more help than the mere consideration of albumin and casts.

The subject of faulty metabolism as a cause of albuminuria is deservedly attracting more attention of late. There seems but little doubt that this is the direction in which we must look for the etiological factors of at least one type of nephritis, namely, the interstitial or chronic contracting kidney.

Cases of cyclic vomiting in children or cyclic appearance of lesions related to the so-called uric acid diathesis, are accompanied by an

albuminuria with or without casts. These cases show a faulty nitrogen partition, also cyclic in character, the attack corresponding to the time when the fault in oxidation is greatest. The albuminuria is not nephritic in character, but is the result of renal irritation, due either to the faulty composition of excretory products, or to a hepato or other toxin the nature of which is unknown. When these cases present attacks at frequent intervals, and the albuminuria with casts scarcely subsides before the occurrence of the new attack, careful observation is necessary to distinguish them from cases of nephritis with frequent exacerbations, in which, however, the faulty nitrogen partition is usually absent or at most present to a slight degree only, not sufficient to lead to confusion. Long-continued renal irritation due to this cause is undoubtedly a causative factor in interstitial nephritis, and frequently results in that lesion.

Intestinal autointoxication is not only the cause of a more or less distinct train of symptoms, and frequently explains otherwise obscure manifestations, but it may also be the direct cause of a long-continued functional albuminuria, with or without casts, often difficult to differentiate from a true nephritis. When it is recalled with what facility disturbances of the gastro-intestinal tract are occasioned in the young, and when it is kept in mind that intestinal toxæmia is particularly prone to cause complicating disorders in them, the necessity for early diagnosis of this condition is evident. The laboratory aids which assist in directing attention to this intestinal toxæmia are important, and the chief one is the recognition of a relative excess of etherial sulphates in the urine. As indoxyl sulphate is one of the varieties most frequently present in excess, a test for indican should form part of every urine examination. This is a very simple matter, and will lead to the recognition of most of the cases, but a direct quantitative estimation of the mineral and etherial sulphates is naturally the more accurate procedure, and consequently better for clinical deduction. It is self-evident that a depression in the ratio of mineral and etherial sulphates, or an excess of indican in the urine, being accompanying factors only, and not directly concerned in the actual causative element of the symptoms or of the albuminuria when it occurs, may be brought about by other causes, and thus do not necessarily indicate a specific pathological process. While admitting this, their corroborative value in the diagnosis of intestinal toxæmia cannot be denied, it being the best available method known at present, in the absence of definite information as to the nature and determination of the actual toxin or toxins concerned.

ALBUMINURIA, FUNCTIONAL. *Prof. J. Rose Bradford, D.Sc., M.D.*

The importance of functional albuminuria, at any rate from a diagnostic standpoint, is steadily increasing: as there can be little doubt that a large number of cases are now wrongly attributed to organic disease of the kidneys, and grave injustice is often done to the interests of the patient. The examination of the urine in a large

number of individuals, especially as a result of insurance work, would seem to show that the number of cases of so-called functional albuminuria is far greater than has hitherto been supposed. Further, according to Collier's observations, albuminuria, sometimes considerable in amount, occurs in by far the greater number of healthy young men engaged in athletics after severe exertion, and this is especially true in the case of rowing men. There is no reason so far as is known at present, to suppose that such albuminuria leads to any after effects of importance.

Stejskal[1] makes a statement that postural or orthostatic albuminuria may be seen in 77 per cent of young men, and that in addition to the albuminuria other symptoms, such as lassitude headache, vertigo, faintness, palpitation, weakness of pulse, together with cyanosis of the extremities, are frequently present. In addition to these symptoms this author states that arhythmia and augmentation of the area of cardiac dullness, together with a systolic murmur and accentuation of the pulmonary second sound, are physical signs that are often present. It is exceptional for accentuation of the aortic second sound to be present. As much as from two to eight parts per thousand of albumin may be present in the urine in the upright posture. The albuminuria usually appears within a short time after rising in the morning, but in certain instances this author states that it does not appear until mid day. The symptoms generally become less with the prolonged duration of the condition, and the author states that the albuminuria has been known to last for as long as seventeen years, and that sometimes several members of a family are affected.

A very large number of explanations have been suggested as causes of this albuminuria, more especially circulatory disturbance of the kidney, pressure on the renal arteries, kinking of the renal vessels as a result of the undue mobility of the kidney, and metabolic disturbances, and some authors have suggested that occasionally there may be a congenital anomaly. Stejskal states that in three instances he has observed a chronic nephritis developed as a sequel to orthostatic albuminuria and he thinks that three types of cases may be differentiated: in one an orthostatic albuminuria may be the first manifestation of a chronic nephritis; in the second group the albuminuria is to be regarded as a manifestation of puberty, and it disappears in from two to three years; and in the third group there are probably renal lesions of a non-progressive nature, perhaps associated with disturbance of the vasomotor regulation of the renal circulation. Other authors, and particularly Von Noorden, have suggested that postural albuminuria may be due to contraction of the renal vessels produced by excitation of the renal nerves by traction or compression, and that the albuminuria results from the changes induced in the kidney by the temporary diminution of the arterial blood-supply, and is therefore similar to the albuminuria produced experimentally by temporary compression of the aorta.

There is much difficulty in determining the course of action to

be followed from the life insurance point of view in these cases. Many advisers of insurance offices reject all albuminurics, others are guided in their action by the presence or absence of signs of definite renal disease, such as polyuria, cardiac hypertrophy, and vascular changes. The custom of most medical officers at the present time would seem to be to reject all cases of albuminuria where there are any signs or symptoms of renal disease, and to submit the cases where albuminuria is the sole phenomenon to repeated examination, and only to accept them after the urine has been found free from albumin on more than one occasion at different times of the day.

REFERENCE.—[1]*Sem. Méd.* Ap. 1908.

(*Vol.* 1907, p. 92)—Dukes recognizes three classes of functional albuminurics among schoolboys. The first is characterized by a raised arterial tension ; cases of this type require a reduction of the food protein and **Blue Pill** occasionally. In the second class the pulse is large and soft, the extremities chilly, the heart large, and chilblains common : these patients need full diet with **Strychnine** and **Arsenic**. In the third group, the arterial tension varies, the patients are neurotic and sparely built. For these **Bromides** are advised, with occasional **Blue Pill**. Games and work need not be interfered with. Wright and Ross have used **Calcium Lactate** ; the albuminuria stops after 60 gr. have been given.

ALCOHOLISM.

(*Vol.* 1907, p. 98)—Treatment is useless if against the patient's will. If he consents, order absolute abstinence from alcohol and prescribe a healthy time-table to be carried out under supervision and away from the usual surroundings. The "sinking feeling" is to be treated by bitter tonics. Some advise, in addition, **Atropine** and **Strychnine** given hypodermically, either in small doses or in doses mounting up till physiological effects are produced. In the latter plan the dose is then gradually decreased, the strychnine being kept on for several weeks after the atropine has been discontinued.

ALOPECIA VULGARIS.

(*Vol.* 1908, p. 118)—Lassar recommends : (1) Shampooing with warm water and with Sodii Bicarb., Potass. Bicarb. āā ℥iv, Saponis ℥iiss, Aq. Rosæ ℥iv. Wash scalp in plain water and dry with towel. (2) Compresses are next to be applied for half an hour, soaked in Hydrarg. Perchlor. gr. v, Phenol Liq. gr. x, Aq. Dest. ad ℥v. (3) Remove compress, dry hair in air, rub scalp with thymol in alcohol at 90° C., a 1–400 solution. (4) Finally use a little of the following ointment : Acidi Salicyl. gr. iss, Tinct. Benzoini Co. ℥ss, Ol. Olivæ ℥x, Ol. Bergamot ♏xv.

AMBLYOPIA, TOXIC.

(*Vol.* 1891, p. 99 ; *Vol.* 1906, p. 344)—Remove the cause (tobacco or alcohol, rarely tea). Give **Strychnine** or **Pilocarpine** in small hypodermic doses daily, or internally with **Potassium Iodide**. Recovery is quickened if the patient takes copious draughts of water (4 pints daily), each draught being followed by a brisk walk in the open.

AMENORRHŒA.

(*Vol.* 1890, p. 122 ; *Vol.* 1894, p. 70)—In anæmic cases give iron (*see* CHLOROSIS), **Potass. Permanganat.** gr. j to ij t.d.s., or **Manganesii Peroxid.** gr. ij t.d.s. It is said that **Iron** is far more efficacious when combined with **Ergot**, as in the following mixture : ℞ Ext. Ergotæ Liq. ℥ss, Tinct. Ferri Perchlor. ♏x, Acid. Phosph. dil. ♏x, Aq. Chloroformi ad ℥j, three times daily after food. Remember tuberculosis and mental overstrain as possible causes, and treat accordingly.

ANÆMIA (PERNICIOUS).

J. G. Emanuel, B.Sc., M.D.
L. G. J. Mackey, M.D.

This is a subject which always takes a prominent place in medical literature, and since the discussion which took place in the Pathological Section of the British Medical Association meeting in 1907,[1]

there have appeared several important papers, of which that by Marcel Labbé and Salomon[2] is particularly interesting, as it closely sets forth the Continental as opposed to the English views as to the etiology of this disease. The French physicians point out that it is impossible either by the clinical features or by the examination of the blood to distinguish, as a separate entity, pernicious anæmia from the severer forms of anæmia due to discoverable and often removable causes, among which may be mentioned (1) Repeated hæmorrhages as from gastric and intestinal ulcer; (2) Intestinal parasites, e.g. bothriocephalus; (3) Ankylostoma duodenale; (4) Malaria; (5) Microbic infection; (6) Tuberculosis; (7) Syphilis; (8) Cancer; (9) Auto-intoxication from gastro-intestinal troubles; (10) Nephritis; (11) Frequent pregnancies; (12) Lead poisoning. It is admitted that as a rule the above conditions do not produce pernicious anæmia, and the reason that they appear to do so in some cases may be that they act in combination, or over long periods, or on predisposed individuals, or by attacking a particular tissue such as the bone-marrow, or possibly because hæmolysins only act injuriously when in an excessive dose, while small doses actually stimulate the blood forming organs. After carefully going into the etiology, symptoms, hæmatology, morbid anatomy, and effect of treatment, their conclusions may be summed up as follows: (1) That pernicious anæmia is not a separate morbid entity; (2) That it is simply a clinical syndrome connected with excessive destruction of blood combined with insufficient repair; (3) That this syndrome has no precise limits, but that just as there are all grades between a mild anæmia and a severe one, so there are intermediate forms between the severe anæmias and pernicious.

Hunter's conclusions are exactly opposite to the above. He regards pernicious anæmia as a definite specific, hæmolytic infective disease, localized to the alimentary tract, with a characteristic mode of onset, clinical features, course, and characteristic hæmolytic and infective lesions. He holds that none of the causes enumerated above, acting alone or collectively, are capable of producing all the features and lesions of pernicious anæmia. This hæmolytic infection is closely associated with drain poisoning, having its site in the tongue or the mucosa of the stomach and intestine.

One thing seems quite clear, viz. that the physician to-day has before him the duty of excluding the severe secondary anæmias before diagnosing pernicious anæmia, and that he cannot rely on the examination of the blood: for the presence of megaloblasts, of poikilocytosis, and of a high hæmoglobin index with a very low red count, are features not confined to pernicious anæmia. Neither can he trust the lemon-tinted skin, for hæmolysis occurs in other anæmias. A specific infection encourages the hope that there may be discovered a specific remedy; and it is in the direction of vaccine therapy that we ought to look.

Good results are reported from the use of large **Colon Douches**, from feeding on **Bone-marrow**, and from the action of **Rontgen Rays** on the

bone marrow. The stimulating effect of small doses of **Hæmolytic Serum** on the blood-forming organs appears to be proved, and as any serum appears to be hæmolytic, the ordinary anti-diphtheritic serum may be used subcutaneously. In judging the value of new remedies in this disease it is absolutely essential not to lose sight of the fact that a temporary recovery is one of the striking features of the disease, and is liable to be attributed to the effect of treatment.

References.—[1]*Brit. Med. Jour.* Nov. 1907 ; [2]*Rev. de Méd.* Ap. and May, 1908.

ANÆSTHESIA. *R. J. Probyn-Williams, M.D.*

The "Open" Method of administering ether has recently been tried more extensively in this country. It is widely employed in America, where it is practically the routine anæsthetic with some administrators, and it is being used to a considerable extent on the Continent. The apparatus required is simple. A Schimmelbusch mask, somewhat larger than the size generally used for chloroform, covered with about ten layers of ordinary white surgical gauze, will form a suitable inhaler. Bellamy Gardner[1] suggests such a mask, modified to fit the face more exactly, and finds that an indiarubber pad round the edge of the mask may make the breathing as laboured as with an ordinary "closed" inhaler. The mask should not rest directly on the face, but on a pad of gauze. Ether is dropped from an 8-oz. medicine bottle with two glass tubes passed through the stopper, and the rate at which the ether runs out of one tube may be controlled by a finger placed on the other. Brownlee[2] prefers to make two holes in the cork and let the ether drop from a cotton wick placed through one of them. He uses two bottles, one of which gives a smaller drop than the other, so that he can regulate the supply more exactly. The administration consists in adjusting the mask while it is dry, and gradually dropping ether on to it, and the result is said to be not unpleasant if the ether is added gradually ; but many administrators begin with a few drops of some mixture of chloroform and ether. Gardner considers six or seven minutes as the average time required to produce the third stage of anæsthesia, but this time may often be considerably exceeded, especially with alcoholic men.

The advantages claimed for the "open" method are that the patient's colour remains normal, there is less secretion of mucus and saliva, and the breathing is less laboured, and therefore of a type more suitable for some abdominal operations. Vomiting after the operation has been reduced in the practice of one anæsthetist from 75 to 32½ per cent. The drawbacks are that very large quantities of ether are used, up to 12 or 16 oz. for a long operation, and that the air of the operating-theatre becomes unpleasantly full of ether vapour. In many instances, too, considerable time is required to obtain a suitable degree of anæsthesia. But the greatest drawback is the increased risk of bronchitis or pneumonia following the operation : in Brownlee's 257 cases, two patients died of pneumonia. The

possibility of igniting the inflammable ether vapour must not be forgotten. Miss Magaw[3] gives $\frac{1}{6}$ gr. of morphine and $\frac{1}{150}$ gr. of atropine thirty minutes before the operation, to diminish the secretion of mucus.

With practice the amount of ether used may be diminished, and in carefully selected cases this method may be very useful; but it is doubtful whether it will become so generally employed here as it is in America. It is unsuitable for patients with bronchitis, but may be used for all other cases for which ether is a good anæsthetic. It is specially useful for weakly people who have to undergo a serious operation producing a considerable amount of shock, and this good result may be obtained by using ether in a Rendle's inhaler, or on a Skinner's mask in place of the A.C.E. mixture, or the pure chloroform, as the case may be, with which the administration may have been begun.

"*Delayed Chloroform Poisoning*"—*Fatty Acid Intoxication.* This subject, which has already been noticed in the *Medical Annual* for 1904 and 1905, has received considerable attention during the past year. Guthrie,[4] in a paper read before the Society of Anæsthetists, gave a complete account of the condition.

The symptoms usually do not appear till twelve or even thirty-six hours after the recovery from the anæsthetic. The patient first becomes wildly excited, uttering piercing cries. Consciousness may be lost and never be regained. But sometimes the delirium alternates with drowsiness. The eyes are sunken, the pupils dilated, the face haggard, and the abdomen retracted. Thirst is intense, and emaciation is rapid. Coma may supervene and death may occur from gradual failure of the heart and respiration; or it may occur suddenly from cardiac failure during a period of excitement. The patient does not complain of pain. Jaundice is uncommon, but when it is present the symptoms are those of acute yellow atrophy of the liver. Pyrexia is uncommon, but the temperature may rise to 105° or 106° F. The pulse is quickened and may become uncountable, weak, and irregular. Vomiting is the earliest and most constant symptom. The vomit is at first watery, but becomes "coffee-ground" from the presence of altered blood. The urine may be scanty, and albumin and casts may be found in it. Acetone is almost always present in the urine and the smell of it is noticeable in the breath. The urine sometimes also contains diacetic acid. This condition may prove fatal in twelve hours or may last a week; the average duration is three or four days. Guthrie considers that these symptoms are present in miniature after a large proportion of operations under anæsthetics, but thinks that recovery is more frequent than death. The fatal cases recorded up to the present are under a hundred. On post-mortem examination the appearance of the liver is characteristic. It is strikingly pale, and is sometimes a canary or tawn colour, studded and streaked with minute purple specks and lines. It is intensely fatty. The heart muscle is occasionally found fatty, and the muscular striæ may be granular and indistinct. The kidneys often show marked

cloudy degeneration, and fatty change in the renal parenchyma. The cases first recorded followed the inhalation of chloroform, hence the name "delayed chloroform poisoning"; but Brackett, Stone, and Low[5] record cases after ether.

Guthrie's conclusions are: (1) That the symptoms of the so-called "delayed poisoning" by anæsthetics are those of acute fatty acid intoxication; (2) That post-mortem examination reveals extensive fatty changes in the liver, fatty and necrotic changes in the kidneys, and sometimes in the heart; (3) That the fatty acids which produce these symptoms, namely β-oxybutyric and diacetic acid, which are the highly poisonous precursors of acetone, are themselves the result of insufficient oxidation or imperfect metabolism of fat; (4) That fat in excess must be present somewhere in order to give rise, by its imperfect metabolism, to fatty acid intoxication; (5) That the liver, being the chief seat of the metabolism of fat, must naturally be the chief organ suspected; (6) That all, or nearly all, the diseases and conditions under which operations followed by fatal symptoms of acid poisoning have been performed, are those which are known to be associated with fatty liver. These conditions are sepsis (acute and chronic) and diabetes; rickets and infantile paralysis, which have been treated by over-fattening and under-exercise; also probably alcoholism, and certainly starvation. Cyclical vomiting with acetonuria is an important addition to the above.

He believes that when a liver on the verge of inadequacy to deal with the fat which is accumulated in it from various causes, is subjected to the breaking strain of an anæsthetic, which still further decreases the powers of oxidation and metabolism, the anæsthetic may act as the "last straw," and fatty acid intoxication result. This is more likely to occur with chloroform, which has a specific action in inducing fatty changes in the liver and other organs, and in interfering with the function of elimination. He draws the following practical conclusions: (1) Operations should be delayed when possible if a fatty liver is suspected. (2) When a child has recently vomited, apparently without cause, an intended operation should be postponed. (3) When fatty liver is suspected, the patient should be kept for some days on a diet restricted in fats. (4) Bicarbonate or citrate of soda should be given meanwhile in order to neutralize fatty acids which may be present. Mild purgation may be beneficial. (5) Starvation will give rise to acute acetonuria; therefore nutrient enemata should be given two hours before and immediately after an operation. (6) Though any anæsthetic may be dangerous in the presence of a fatty liver, chloroform is most dangerous of all, on account of its specific action on the liver and kidneys. The treatment of acid intoxication following operations should be by **Venesection, Saline Transfusion,** and by **Clysters** of solution of **Bicarbonate of Sodium.**

In the discussion which followed, Hunter pointed out that, though the symptoms of acute fatty acid intoxication are similar to those of acute yellow atrophy of the liver, the pathological changes are

distinct, for in yellow atrophy there is not a deposit of fat, but complete necrobiosis. Rolleston suggested that acid intoxication is produced by the action of chloroform on the fat of the body as a whole, and that the fatty change in the liver followed; in other words, acidosis produces fatty liver, and not *vice versa*. Dudley Buxton objected to the expression "chloroform poisoning," because he considered that the effect of the anæsthetic was not proved. Acidosis has been shown to occur without any symptoms and without the inhalation of any anæsthetic, and he could not believe that the small quantity of a rapidly eliminated anæsthetic like ethyl chloride can produce any lasting effect, that is to say any morphological change. He thought that perhaps an anæsthetic might be the last link in the chain of the causes bringing about death, and considered that the diseased condition of the kidneys was as important as the state of the liver. He believed that a high percentage of anæsthetic vapour is more likely to injure protoplasm than a low one. Sutherland pointed out that the symptoms of this state are the same, whether it is due to cyclic vomiting, chloroform poisoning, salicylic poisoning, the uncontrollable vomiting of pregnancy, or acute yellow atrophy of the liver. He did not believe that acidosis was produced by the toxic action of chloroform, but that, as a result of chloroform, some check action was removed from the metabolism, and fatty degeneration was allowed to take place.

The subject was further discussed at the annual meeting of the British Medical Association[6] by Guthrie, Spriggs, and others. Langmead stated that he had performed post-mortem examinations on about 1000 children during the past five years, and in none of them had he found the peculiar liver associated with this condition except in three cases of cyclic vomiting. It was also pointed out that the age at which most of the patients have died after the administration of an anæsthetic corresponds with that at which cyclic vomiting is most common, namely between two and ten; and a further similarity was noticed in that girls suffer more frequently than boys. This is the age at which metabolism is most active.

Campbell[7] considers from four to five the most dangerous age, and points out that at this time children are practically herbivorous animals, which are known to take chloroform badly, whereas infants who are living on milk do not suffer from this condition.

Individual cases have lately been described in detail in the medical papers, seven being quoted in the *Lancet* for Feb. 29th 1908. Most of these followed the administration of chloroform, but Cunningham[8] reports a case of acid intoxication following ethyl chloride, with recovery.

Beesly[9] examined the urine of children between the ages of four and twelve before and after anæsthesia, and found that chloroform and ether both produced a temporary acetonuria in most cases. Ether produced a more marked acetonuria than chloroform, but he considers that the larger quantity is less likely to harm the patient because the liver and kidneys are not affected by ether as they are by chloroform.

Beesly considers that acute acetonuria is more dangerous than the chronic form, because in the latter the kidneys have become accustomed to eliminate the acetone.

Telford and Falconer[10] examined the urine in 143 cases, and found that chloroform, ether, and ethyl chloride produce a temporary acetonuria in most cases, and that there is no relation between the duration of the anæsthesia and the severity of the acetonuria.

Beddard[11] suggests that the patients should be fed with dextrose, either by the mouth, or by rectal injections of a 10 to 20 per cent solution, or even by intravenous infusion of a 6 per cent solution.

Hunter[12] considers that vomiting after anæsthesia is due to profound depression of the liver function, and that this is increased by long abstinence from food before the administration. He suggests a nutritious and easily digestible meal, well sweetened, to be given two or three hours before operation.

The subject must at present be left in this stage. There can be no doubt that a condition of fatty acid intoxication may manifest itself after anæsthesia, more especially after chloroform, but the exact rôle of the anæsthetic in its production is by no means clearly defined. To explain the rarity with which this condition follows anæsthesia, even with chloroform, the term idiosyncrasy has been invoked, but this does little to afford a scientific explanation.

Status Lymphaticus.—The relation of this condition to general anæsthesia has been discussed at length by McCardie[13] in a paper read before the Society of Anæsthetists.[14] This condition may be recognized on post-mortem examination by the following signs: An enlarged thymus, an enlarged spleen with varying degrees of prominence in its follicles, tumescence and hypertrophy of lymphatic glands in various regions (especially in the mesenteric, retroperitoneal, and cervical), noticeable prominence and multiplication of follicles at the base of the tongue and in the pharynx, enlargement of the tonsils, swelling of the solitary follicles and Peyer's patches in the intestines, a dilated heart (especially is the right ventricle dilated), and extremely flaccid cardiac muscle. Though this condition has in most instances only been discovered after death, Escherisch says that it should be possible to recognize it during life by the following signs: A pale, thin skin, pasty complexion, a good deal of subcutaneous fat, frequently signs of rickets or scrofula, enlargement of the superficial glands, especially in the neck and axilla, enlarged tonsils, adenoid growths, and a palpable spleen. In addition to the above signs, McCardie adds that in more than 50 per cent of the cases the thyroid gland is also enlarged.

There is no doubt that sudden death has occurred without any obvious cause, and that the post-mortem examination has revealed the signs of the condition—one such case was reported by Macintyre[15] this year,—but the manner in which this condition may produce death is still a subject of discussion. Two theories have been advanced: one that it may result from pressure of the large thymus, and the

other that it is caused by toxæmia. Several members of the same family have been known to die suddenly with the signs of this condition, and it is frequently associated with other states of poor development, such as rickets, cleft palate, etc., and with other conditions, as epilepsy and Graves' disease.

It is obvious that a condition such as this, in which death is liable to occur without any reasonable cause or from one so trivial as the application of cold water in a bath, must constitute a great danger when the patient has to take an anæsthetic. In thirty cases of death during anæsthesia which McCardie has collected, chloroform had been administered in seventeen cases, ether in six, a mixture of chloroform and ether in five, nitrous oxide in one, and in two the anæsthetic was not stated. Two cases of death during an operation under local anæsthesia have been reported, and one following the injection of $\frac{1}{4}$ gr. morphia. McCardie considers that when an anæsthetic is to be given to a patient in whom the "status lymphaticus" is suspected, ether should be given by the open method whenever possible, and a closed inhaler should be avoided on account of the possibility of congestion. He would prefer a mixture to pure chloroform, and advises that the head should be kept as low as possible. He also advises the injection of 5 min. liq. strych. with one min. liq. atrop. half an hour before the operation, to be repeated if necessary. Should syncope occur during anæsthesia—and the most likely time is when the patient is passing from the second to the third stage—massage of the heart would be the most appropriate treatment.

Harvey Hilliard[16] records the death of a male patient, aged 21, to whom he was giving chloroform for circumcision the typical signs of this condition being found at the post-mortem examination; and another has been reported by Rubra.[17]

Spinal Analgesia. This subject has received considerable attention during the year. Barker[15] reports a second series of 100 cases in which he has obtained better results than in the first 100 both in greater uniformity in the anæsthesia and in the freedom from after-effects such as vomiting and headache. This improvement he attributes to a fuller appreciation of the effect of gravity on the fluid when injected into the dural sac, and the limitation of its action, as far as possible, to particular areas of the spinal canal. He disagrees with Dönitz[18] who considers that the height of the anæsthesia is determined by the position of the patient after the injection and is due to the "shifting of the balance of the liquor spinalis which takes place at the moment on the change of posture," there being no question of the influence of gravity or the effect of diffusion. Barker has made careful experiments with a fluid of higher specific gravity than the cerebrospinal fluid and these should be studied. He comes to conclusions quite opposed to those of Dönitz. The article should be read for the description of the technique.

In these 100 cases 1 cc. of a solution made by Billon was generally injected, containing 5 cgrams of **Stovaine**, with **Glucose** added to

make the specific gravity of the fluid 1·023, as compared with 1·007 of the cerebrospinal fluid. No adrenal derivative was used in addition, and Barker suggests that this may be an explanation of the freedom from headache which resulted. In only six of the cases was a general anæsthetic necessary. Two interesting cases are quoted in which complete abolition of sensation and motion was obtained in one leg, without interference with the motor or sensory functions of the other. In each case the patient was placed on the side to be operated upon before the injection, and kept in that position throughout the operation. Henry Head,[18] after studying some of these cases, concludes that stovaine probably acts on the motor and sensory fibres in the spinal canal, or just after they have entered the spinal cord.

In his third reported series of 100 cases Barker[20] has employed the same technique, and used the same fluid, except in twelve cases in which **Tropacocaine** was tried, and which seemed to Barker to be more depressing than stovaine. There were only two failures to puncture the dural sac, and a general anæsthetic was used on only three occasions. He quotes two cases, not included in the 100, in which death followed a severe abdominal operation, and in which he considers that the stovaine contributed to the death. Barker warns beginners with this method not to employ it in debilitated patients for severe operations on the abdomen requiring high anæsthesia. He considers that the marked pallor, which is often noticed soon after the injection, is due to cerebral anæmia from the complete relaxation of the abdominal muscles, and the consequent filling of the abdominal veins. He has not seen this end fatally, but the faintness has usually been followed by slight retching, with a rapid return to comfort.

Dean[21] advocated the use of **Stovaine** at the annual meeting of the British Medical Association, and again before the Society of Anæsthetists.[22] He has found it specially useful in emergency operations on patients with general septic peritonitis, a practice which is strongly condemned by most foreign surgeons on account of the septic meningitis which is likely to occur.

McGavin[23] gives some careful statistics of fifty cases of stovaine injection, in six of which a general anæsthetic was required, but the analgesia obtained was otherwise perfectly satisfactory.

Hey Groves[24] concludes that at present spinal analgesia is valuable (1) In operations involving great shock; (2) In operations of desperation: (3) For patients with severe diabetes, acetonuria, or acid intoxication, or severe lung disease; (4) In emergency cases, as compound fractures and strangulated hernias, when an anæsthetist is unavailable. He considers that spinal analgesia is uncertain in about 4 per cent of the injections.

Oehler,[25] of Hamburg-Eppendorf, gives an account of the results of 1000 cases of spinal analgesia. **Stovaine** was used in the first 186 cases, 161 of these being considered satisfactory; 24 were not, a general anæsthetic being required in 15. There were 30 cases of collapse, one very marked in an operation for prostatectomy. **Novocaine** with

the addition of suprarenin was then tried in 574 cases: 15 were unsuccessful and the after-effects were more marked than with stovaine. There were 21 cases of temporary collapse, and 2 of gasping for breath. In 73 cases instances in which **Alypin** was tried two were complete failures and in two others the analgesia was insufficient. Since September, 1906, he has always used Dömtz's preparation of **Tropacocaine**. In the first 146 cases general anæsthesia was required 8 times, and 6 were unsatisfactory. Tropacocaine is considered by Oehler to be the most harmless of the substances used to produce spinal analgesia, and its only drawback is the comparatively short anæsthesia it produces, the average being three-quarters of an hour: his total cases now exceed 1,000, and with improved technique the results are better. A freshly prepared and sterilized 5 per cent solution of tropacocaine is used, to which one drop in 1000 of suprarenin is added after sterilization. The dose is from 1 to 1½ cc.

Space will not permit reports of all the cases in the Continental papers among which are Veit,[26] of Stuttgart 150 cases; Vincenzo,[27] 207 cases with stovaine; Feliziani,[28] 203 cases with stovaine, and many others. Most of the writers are very favourably impressed with the results of spinal analgesia; but at a meeting of the Société de Chirurgie, of Paris divergent opinions were expressed. The reports[29] should be read.

It is interesting to read a summary of the *Anæsthetics given in the Private Practice* of a Continental surgeon, as in an article by Caro[30] describing those given in Professor Israel's private clinic. In 1400 cases 850 were anæsthetized with chloroform, 45 with chloroform and oxygen, 128 with chloroform and ether, 200 with ether alone (by the drop method), 130 with scopolamine and morphine, and 50 by spinal injection. Scopolamine has been abandoned, and so has the mixture of chloroform and oxygen, which was followed by vomiting in 90 per cent of the cases. There was one death directly due to chloroform: Three other patients died on the table—one from the entrance of blood into the bronchi during an operation for gangrene of the lung, and two from cardiac and pulmonary emboli from malignant tumours of the kidney. Tropacocaine was used for the spinal cases, with complete success.

Roith[31] reports that in 1333 operations at Heidelberg, 1011 were performed under general anæsthesia 100 under spinal analgesia, and 222 under local anæsthesia. Of the first class 80 were with pure chloroform, 428 with Billroth's mixture 200 with ether (103 by the drop method) and 207 were begun with chloroform or Billroth's mixture and completed with ether. In the second class, stovaine and tropacocaine were used. In 52 instances the result was very good in 15 good in 13 a little ether had to be given on account of pain, and in 20 cases recourse was had to general anæsthesia. One-third of the cases of spinal analgesia suffered severely afterwards. Roith concludes that spinal analgesia should be

used for operations on large hernias of long standing, and for extensive operations on the lower extremities. It is being used less frequently, (1) owing to its unreliability, (2) because it is not less dangerous than general anæsthesia, (3) because of its unpleasant after-effects. He prefers general anæsthesia for most purposes, and is still undecided on the advantages of a combination with **Morphine** or **Scopolamine.** He thinks that local anæsthesia with **Novocaine** should be used more extensively than it is, especially in combination with general anæsthesia.

The advantages of spinal analgesia are now generally recognized and by better technique the results obtained are more satisfactory, but more accurate knowledge is required as to the death-rate. In the first series of 5000 cases there were 5 deaths. Vincenzo[27] gives 5 deaths in 3,000 injections of stovaine, and 3 in 4,000 cases with tropacocaine. He quotes Venus, who has collected 16 deaths, and gives accounts of several cases, but it is not clear whether they are included in the numbers mentioned or not. Hardouin[32] gives an account of the death of a patient from stovaine, and quotes 15 other deaths from the same drug.

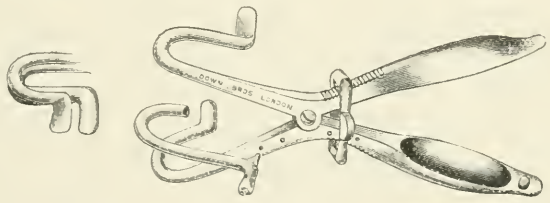

Fig. 9.—Colt's Anæsthesia Mouth Gag.

Apart from a fatal ending, many untoward after-effects are reported as the result of spinal analgesia. Meningitis has on several occasions followed spinal injection in a septic patient. Paralysis of ocular muscles—generally the external rectus—has also occurred, and two cases of cerebral softening have followed the injection of stovaine. Schwartz[33] has examined the urine of patients with previously healthy kidneys, and after the injection of stovaine found evidence of nephritis in 78 per cent of the cases. This lasted on an average six and a half days, but in one instance persisted for a month.

Colt[34] has studied the mechanics of the mouth gag, and has devised the form shown in *Fig.* 9. The instrument is also made, if preferred, with a spring not shown in the illustration. It is made of steel, nickel-plated, with overlapping tooth-plates for convenience in introduction, and a detachable anæsthetic tube, while the measurements of the various parts have been accurately fixed.

In order to obviate obstruction to respiration from occlusion of the air-tract above the larynx, Hewitt[34] has devised an artificial air-way for use during anæsthesia. It consists of a circular metal

ring with a deep groove, so that it may be held firmly by the teeth, and attached to it an indiarubber tube about 3 in. long, cut obliquely at its free end. The internal bore of the ring and the tube is ½ in. (*Fig.* 20). When the breathing is laboured or noisy this tube may be introduced into the mouth with the oblique opening facing the laryngeal orifice, and the metal ring held by the teeth or gums. It has proved of service especially for patients in the Trendelenburg position, when the swollen tongue frequently obstructs respiration.

Fig. 20.—(Barth.) Actual Size.

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ANALGESIA. (See ANÆSTHESIA.)

ANEURYSM.

John Cowan, D.Sc., M.D.

Arnold[1] emphasizes the fact that early diagnosis is as important in thoracic aneurysm as in phthisis, if satisfactory results are to be obtained. He states that the outline of the right border of the aortic arch can be clearly delimited even in normal individuals by light percussion, the dullness extending for 2 to 3 cms. to the right of the median line, with a curved border. The left border is less distinct, and only 1·5 to 2·5 cms. from the median line, as the vessel here leaves the anterior surface of the chest and bends backwards. A dilated aorta reaching near to the chest wall can be easily delimited, and an increased area of dullness demonstrated. Cardiac valvular disease and aortic aneurysm often co-exist, and the existence of the latter may be missed on the assumption that all the symptoms are due to the former. Dyspnœa may thus be due to aneurysmal pressure on the respiratory tree, and not to the co-existing valvular flaw. The differential diag-

nosis can, however, generally be made. Any increase of the arterial pressure usually increases, and any decrease diminishes, the symptoms of aneurysm, and the administration of vasodilators, such as nitroglycerin, shows by the relief of symptoms the nature of their cause. It is from observations in cases of this nature that nitroglycerin, etc., have been wrongly judged to be cardiac stimulants. Positive evidence with the X rays is of value, but negative findings are of little value.

Williamson[2] has examined a number of cases of aneurysm, and estimated the blood-pressure in the two brachial vessels. He finds that the blood-pressure in cases of aneurysm is usually normal or slightly above normal. In the majority of cases there is a slight (5 mm. or more) difference between the pressure on the two sides, and in a minority of cases a considerable variation. The smaller variations are of no value in the differential diagnosis between aortic aneurysm and dilatation. Greater difference than 20 mm., however, is strong evidence in favour of aneurysm of the arch or ascending aorta.

Drummond[3] analyzes the symptoms in some 300 cases of thoracic aneurysm, with reference in particular to the relation between the site of the lesion and the distribution of pain. The contribution is valuable, but cannot be shortly reviewed.

Dawson Turner[4] describes the results of his experiments on the effects of **Electrolysis** in blood serum outside the body. The negative pole when introduced into the serum always gives off much hydrogen, and no precipitate forms. Anodes made of platinum, silver, and nickel give little precipitate, but if made of zinc produce a copious one, while no evolution of gas occurs. He suggests that zinc electrodes might be used in the electrolytic treatment of aneurysm.

Whittle[5] contributes a note of his personal experience at Vittel. Cases of dissecting aneurysm affecting the pulmonary artery are reported by Langdon Brown[6] and Lawrason Brown,[7] and a case of aneurysm of the heart associated with mediastino-pericarditis by McElvoy.[8]

References.—[1]*Amer. Jour. Med. Sci.* April, 1908; [2]*Lancet*, Nov. 30, 1907; [3]*Brit. Med. Jour.* Jan. 30, 1908; [4]*Lancet*, June 20, 1908; [5]*Brit. Med. Jour.* June 11, 1908; [6]*Lancet*, June 13, 1908; [7]*N.Y. Med. Jour.* June 4, 1908; [8]*Jour. Amer. Med. Assoc.* Aug. 1, 1908.

ANGEIOMATA. *E. Graham Little, M.D., F.R.C.P.*

The greater part of a paper by Wickham and Degrais[1] on this subject is devoted to the theory of **Radium Therapy.** The physical action of radium is due to its emanation, which is gaseous, and to three kinds of rays, which are called respectively α, β, and γ rays. The rays alone are concerned in the treatment of nævi. The α rays and β rays are particles resulting from the disintegration of radium, electrically charged, positive in the case of α, negative in the case of β rays. These latter are not of uniform size, but are from 1000 to 2000 times smaller than the hydrogen atom; they have a velocity equal to that of light. The α particles are about the size of the hydrogen atom and have a velocity twenty

times less than the β atoms. The γ rays are not due to the passage of material atoms but to perturbations of the ether. It thus becomes practicable to filter the rays by interposing substances between the source and the skin which will absorb one kind while transmitting the other.

The method of using radium by which a thin varnish incorporating the salt is spread over a metallic surface (Danne's varnish) has greatly increased its usefulness. Another device by which textile fabrics may be impregnated with radium and then applied locally, has been much used by these authors, and is especially applicable to irregular surfaces. The angeiomata thus treated were divisible into four classes: (1) Flat angeiomata level with the skin and quite superficial: (2) Flat angeiomata level with the skin, but infiltrating the subcutaneous tissues: (3) Flat angeiomata, slightly raised from the surface, and mammillated or smooth; (4) Soft, raised, pulsatile, and erectile angeiomata. Types of all these classes are described as being benefited to a remarkable degree by radium applications; but the expensive character of the apparatus and its multiplicity put the method somewhat out of reach of all but large and well-endowed institutions.

Another method of treatment of cavernous nævi has been devised by John MacEwen.[2] This consists in introducing through a puncture in the tumour made with a bistoury, small needles of **Metallic Magnesium** cut from magnesium ribbon and duly sterilized. The needles are pushed into the tumour in all directions and left *in situ*, and apparently become absorbed: it is contended that the metal oxidizes in the tissues causing thrombosis of the minute vessels of the tumour, with subsequent fibrous contraction and obliteration of the swelling.

REFERENCES. [1] *Rad. & Med.* June 16, 1906; [2] *Lancet*, Dec. 15, 1906.

ANGINA LUDOVICI. (*See* LUDWIG'S ANGINA.)

ANGINA PECTORIS. *John [illegible], D.Sc., M.D.*

Sir Clifford Allbutt[1] discusses the treatment of angina pectoris from his standpoint that the majority of cases are the result of lesions of the aorta. In some cases of specific origin—i.e., rheumatism and syphilis—specific antidotes may be of value, while rest, even in bed, for long periods, and eliminative treatment, will, by the reduction of the high arterial pressure which so often co-exists, relieve the stress on the tender part. Dietetic regulations are necessary, the chief rule being strict moderation in the amount ingested. Of drugs the **Iodides** and **Nitrites** are the most useful. During attacks he fuses the nitrites with **Atropine** or **Morphine**, so as to block the reflex by which the heart is inhibited, as it is in this way that death commonly ensues.

Hasselbalch and Jacobäus[2] have employed **Arc Light Baths** with marked success in more than forty cases of angina pectoris. They aim at producing a dermatitis which, after about ten applications, is succeeded by a more or less permanent hyperæmia of the skin. The lessening of the peripheral resistance which is thus obtained is the main cause of

success, the blood-pressure falling about 10 per cent. The other functions of the body are also improved.

Herz[3] recommends a simple procedure in cases of angina pectoris and paroxysmal tachycardia. The patient, who is seated, takes a small quantity of water into his mouth, throws his head backwards as far as it will go, and then swallows. As a rule, eructations succeed the act, and the symptoms are frequently relieved.

Guthrie Rankin[4] reviews the whole subject in the *Clinical Journal.*

References.—[1]*Folia Therap.* Jan. 1908 ; [2]*Berl. klin. Woch.* Sept. 30, 1907 ; [3]*Sem. Méd.* June 3, 1908 ; [4]*Clin. Jour.* Nov. 6, 1907.

ANKYLOSTOMIASIS. *J. W. W. Stephens, M.D.*

T. F. MacDonald[1] reports the existence of ankylostomiasis in the Johnstone River district, between Townsville and Cairns, Australia. The author draws attention to unrecorded psychological symptoms, showing themselves in the form of immorality: e.g., a general demoralization has been observed among school-children. F. M. Sandwith[2] states that **Thymol** is not a safe drug for the old or very young; he prefers **Oil of Eucalyptus** 30 min., **Chloroform** 45 min., castor oil 10 dr. A. M. Elliott[3] states that before giving thymol he prepared the patient with podophyllin.

J. C. Castellvi[4] describes the results obtained by himself in the treatment of ankylostomiasis by β-**Naphthol.** Before each administration of the drug a saline purge was given. From this time to three hours later the patient fasts. The β-naphthol was given in two doses of 1 gram each, eight or nine hours after the purge. An interval of four to seven days is allowed to elapse between the doses. Two hours later, senna infusion, with 30 grams of Glauber's salt (sodium sulphate) and 30 grams of rhubarb infusion, is given. Thirty-three patients were treated. Of these, two became completely worm-free after one, nine after two, twelve after three, six after four, and four after five doses. 83 per cent of the worms are expelled after one dose. The author considers the treatment superior to the chloroform-eucalyptus method, as this latter sometimes requires eleven doses to produce freedom from the worms.

E. C. Shattuck,[5] in Bilibid Prison, P.I., used the following treatment:— Phillips's formula is: oil of eucalyptus 2·5 grams, chloroform 3·5 grams, castor oil 40 cc.; but the author gives 30 cc. of this mixture, repeating it in half an hour. Thus at 6 a.m. the patient is given magnesium sulphate, at 8 a.m. the first 30 cc. of the mixture, at 8.30 a.m. a second dose, and at 10.30 a.m. a second dose of magnesium sulphate. The patient fasts until the evening, when he is given light food. Out of 345 cases, 270 patients received one treatment, 58 two, 16 three, 1 four, before the fæces were negative.

Thymol Treatment.—At 6 a.m. magnesium sulphate is given, at 8 a.m. thymol 1 gram, then every half hour 1 gram, for six doses. Two hours after the last dose of thymol another of magnesium sulphate is given. Out of 90 cases, 61 patients received one treatment:

13 two; 9 three; 4 four; 3, five. The latter is inclined to prefer the eucalyptus. The result is confirmed microscopically by examination for the eggs, or macroscopically by examining the fæces for worms in the following way:—Shake up the stool with an equal volume of water, and after a minute or two pour off the supernatant fluid. Repeat this three or four times. The worms are easily detected on the sediment at the edge away from where the water is escaping from the dish.

T. D. Patterson[6] describes the treatment of ankylostomiasis adopted in Porto Rico. In the evening magnesium sulphate or sodium sulphate (30 grams) is given. On the next day the patient is kept in bed without food. Thymol finely powdered 2 grams is given in capsules at 8 a.m.; the dose is repeated at 10 a.m.; at 12 noon a second dose of salts is given. All solvents of thymol, such as alcohol, ether, glycerin, turpentine, or chloroform, are contra-indicated. No deaths were reported as directly due to the drug. The majority of patients had no symptoms, although a few had dizziness, burning in the stomach, and a temporary increase of debility; but intoxication, vertigo, excitement, or smoky urine, were not observed. It is always advisable to build up the health of the patients before treatment. The effect of the drug on œdematous patients is very marked, leading to great increase of œdema, which may prove fatal from its spreading to the brain or lungs. The dose of thymol was regulated chiefly according to the debility of the patient, but usually for age 0–5, ½ gram; 5–10, 1 gram; 10–15, 2 grams; 15–20, 3 grams; 20–60, 4 grams; 60 upwards, 2–3 grams. Thymol was given once a week as long as ova remained in the fæces. Thymol gave the best result of any drug used, for after one dose 76 per cent of all the worms in the gut were expelled.

Male-Fern was found to be valueless. **β-Naphthol** ranks second to thymol; after one dose 72 per cent of worms in the gut are expelled. It was given in the same way as thymol, except that the dose was 2 grams instead of 4. With the exception of some dizziness it was most satisfactory. **Eucalyptol** was *not* found to be efficacious, and moreover its use is considered dangerous. The formula used was that described above.

Dieminger's[7] treatment consisted mainly of **Extractum Filicis** up to 20 grams in two days. The procedure was: 8 a.m. extractum filicis 10 grams, followed by a purge in two hours; on the second day no treatment; on the third day as on the first; on the fourth day examination for eggs in fæces. 97 per cent of the cases were cured.

REFERENCES.—[1]*Lancet*, Jan. 11, 1908; [2]*Ibid.*; [3]*Philip. Med. Journ.*; [4]*Med. & Chir. Pract.* Sept. 21, 1907, in *Munch. med. Woch.* Nov. 26, 1907; [5]*Journ. Med.* Dec. 1907; [6]*Therap. Gaz.* Ap. 15, 1908; [7]*Klin. Jahrb.* 1907, vol. xvii. No. 3, in *Arch. f. Schiffs u. Trop. Hyg.* 1908, p. 475.

ANOREXIA.

Lancet, 1908, p. 25.—The loss of appetite common in phthisis may be treated by **Orexin**. This is given in capsules with water from one to two hours before the principal meals, in 5-gr. doses. It is to be followed by a tumbler of water or broth so that the contents may be spread over the whole stomach.

ANOSMIA. (*See* Nose, Diseases of.)

ANTHRAX. *E. Graham Little, M.D., F.R.C.P.*

Roger and Burvill-Holmes[1] report a series of fifteen cases of anthrax in which the diagnosis was confirmed by demonstration of the bacilli, which were to be found in nearly every organ of the body in the three fatal cases examined. In these cases constant features were œdema of the superficial tissues and of the lungs, fatty liver, acute nephritis, and coagulation; necrosis of the spleen and fatty heart were found in three cases, and pulmonary infarcts in one. Serum treatment with **Serum** prepared by Professor Sclavo, of Sienna, was tried in the majority of the cases, either alone or combined with excision of œdematous areas, and cauterization of the wound with bichloride of mercury. The author considers the combination preferable to the exhibition of serum alone, although this appeared able, *per se*, to effect a cure in four cases in which it was the sole agent employed. The serum is derived from asses vaccinated with anthrax cultures of successively increased virulence, and its protective power is tested on rabbits. The serum is administered by intravenous injection, in doses varying from 10 to 60 cc. It is notable that symptoms of anthrax infection usually appeared within three days of inoculation, and recovery, when this took place, was generally within three weeks.

Another series of eleven cases, all treated by Sclavo's serum, either with or without local cauterization, is reported by Francesco.[2] The routine followed in these cases was to inject 30 cc. daily of the serum, generally subcutaneously, but sometimes intravenously. In four of the eleven cases cure resulted, usually within thirty days; in the seven fatal cases death took place within five days.

A single case with successful issue is recorded by Wilson,[3] in which excision of the infected area with cauterization of the wound by pure **Carbolic Acid** was practised, and two days later an injection of Sclavo's serum, 30 cc. Anthrax bacilli were demonstrated in the smear from the pustule before operation.

Braem, as reported by his assistant, Creite,[4] deprecates radical measures, and uses the following routine: The malignant pustule is covered with compresses of **Aluminium Acetate** (2 per cent), and the patient is rigidly confined to bed, the affected part being raised. If fever is high, alcohol in large doses is given. It is claimed that thirteen patients were so treated, with uniformly successful results. No mention is made, however, of the evidence on which the diagnosis rested.

Schwab[5] likewise urges abstention from surgical interference, and claims to have treated eight cases successfully with **Sublimate Fomentations,** combined in one case with Italian anti-anthrax serum. This latter he recommends in every case, care being taken in the selection of the serum.

References.—[1]*Ther. Gaz.* June 15, 1908; [2]*Il Policl.* Jan. 19, 1908; [3]*Brit. Med. Jour.* Mar. 28, 1908; [4]*Sem. Méd.* Dec. 25, 1907; [5]*Med. Klin.* Feb. 23, 1908, in *Brit. Med. Jour.* Ap. 16, 1908.

ANURIA.

By Hurry Fenwick, F.R.C.S.

The following questions says Watson[1] concerning that anuria which is due to obstruction of the ureter or ureters by stone, are considered settled by a consensus of opinion: (1) In the majority of *fatal* cases of unilateral calculous anuria, the *unobstructed* kidney is either destroyed, functionally useless, or congenitally absent. (2) The mortality of the cases treated expectantly is enormous (between 70 and 80 per cent). That of those treated surgically is approximately but one half as great (from 40 to 45 per cent). (3) The nearer surgical treatment is applied to the beginning of the anuria the smaller is the mortality attending the operations. It is, however, true that the presence of uræmic manifestations, and the fact that the period of anuria has been very long, do not constitute contra indications to operation, nor is surgical treatment necessarily hopeless under these circumstances. (4) The first kidney to be operated upon should be that which is believed to be the *less damaged* of the two. (5) Surgical intervention should not be delayed *more* than forty-eight hours, and in some cases the delay should be less. (6) *The essential indications* are to supply a free avenue of escape for the urine from the kidney, and to remove the calculi *if the patient's condition permits.* (7) Absence of uræmic manifestations and apparent good condition of the patient do not excuse delay in applying surgical treatment.

There is, however, one mooted point not yet settled, but which concerns the operator and the clinician very nearly, and to which Sedgwick Watson[1] calls special attention, namely, the advantages and importance of performing *simultaneous* bilateral nephrotomy, instead of a unilateral operation, in calculous anuria. He writes as follows:—

"The patient with obstructive anuria needs to have restored to activity every bit of renal substance he possesses that is still capable of performing useful functional work. Surgical treatment which fails to accomplish this, fails to give the patient his best chance of life. Does the surgeon who stops his intervention with a nephrotomy or a nephrolithotomy *on one kidney only* always give to such patients the best chance of life? I believe that there is an important number in which he does not do so, and it is to that number that I would apply the *simultaneously done bilateral operation* which I believe may sometimes save life when the unilateral one will fail. The number in which this course seems to me to be indicated is not actually very large but sufficiently so to be worthy of careful consideration. Specifically it is represented by 33 in a series of 187 cases which I have collected and analyzed, or 17·6 per cent of the whole number. The cases which fall into this category are: (1) All in which it is seen that the first kidney operated upon is so greatly damaged as to be, in the operator's judgment functionally inadequate to maintain the life of the individual by means of its secretory work alone, and in which it is not known beforehand that the opposite kidney is either absent or wholly destroyed; (2) All those in which both ureters are obstructed by calculi or in which one kidney is obstructed and there is calculus in the other.

"The first of these two classes will be chiefly composed of cases of unilateral calculus, the second almost wholly of bilateral, and in the larger number of these the two ureters will be simultaneously blocked. The latter condition is recorded in 20 per cent of the whole number; moreover, it is natural to suppose that it would not infrequently happen when calculi are present in both kidneys, and this last condition is certainly not uncommon. I have regarded 30 per cent as a fair estimate of the frequency of occurrence of bilateral calculus.

"The most interesting point brought out by an analysis of the thirty-eight cases of simultaneous obstruction of both ureters is that the renal conditions in twelve were such that the combined functional work of both kidneys was or would have been required in order to maintain the patients' lives, and very probably would have saved them had both organs been given the opportunity to resume their function in cases in which this was not done."

REFERENCE.—[1] *1st Congress Internat. Urol. Assoc.* p. 35.

ANUS, TUBERCULOUS ULCERATION OF.

(*Vol.* 1895, p. 128)—Hartmann recommends **Cauterization** followed by **Iodoform** ointment, when the patient can stand it. If he cannot, treatment should aim at raising the resistance merely. **Opium Suppositories**, or a mixture of **Bismuth Subnitrate** with **Iodoform**, will relieve pain. (Probably **Cocaine** in solution or suppository would be even more efficacious.)

APHONIA, HYSTERICAL.

Purves Stewart, M.D.

In the treatment of hysterical aphonia, the ordinary method is practically a form of suggestion, the modus operandi being to place a laryngoscopic mirror in the fauces, and then in a confident manner to command the patient to phonate. In a large proportion of cases this is enough. More obstinate cases are often cured by the application of faradism to the larynx, either externally or by an intralaryngeal electrode. A small proportion of cases, however, remain, in which both of the foregoing procedures fail, and the patient remains voiceless for months or years.

C. P. Crouch,[1] in an interesting paper, maintains that this "frightening" of the voice back is uncertain in its effect, and that relapses are common. He prefers to attack such cases on a somewhat different principle, as follows: It will be found in almost every case of hysterical aphonia that a laryngeal sound of some sort can be produced, feeble in quality, perhaps a mere squeak, inaudible a few feet away. This noise, whatever it is, should be carefully listened for, and from it a process of re-education should be developed. As a rule the note is one of very high pitch (*C* or *D* above), and is most easily produced by the patient with the mouth closed or nearly so. As the voice becomes stronger, the patient can gradually open the mouth more and more. It is desirable to examine the patient beside a piano, in order that the exact pitch of the laryngeal noise can be determined, so as to start on the same note at the next lesson. Having determined the pitch of the noise, we make the patient hum that particular note. Thus, for example, at the first interview we strike middle *C* on the

piano, and tell the patient to try to sing or hum to it. She probably fails. We then rapidly run up the scale, striking the notes one after the other in succession. With the lower notes, as a rule, no sound is heard beyond a gasp or a whisper, but at last, perhaps when upper *B* or *C* is reached, the patient succeeds in making a faint noise, which is ill-sustained. The next day, however, we start at once with that note, which the patient succeeded in producing the day before, and make the patient repeat this tone possibly a falsetto one in rapid succession, accompanying it by striking the note on the piano. At first the voice is tremulous, but by the end of the lesson, which lasts ten minutes or so, it has usually become firmer. When the voice can sustain the humming noise for a few seconds, the vowel-sound "O" should be attempted, and then "*Do*." The patient often breaks on this syllable, in which case Crouch recommends that she should pronounce it in two parts: "*Do*" and "*Oh*"; she will then whisper the first part and sing the *Oh*, and after a few trials will succeed in singing "*Do*" as one word. By this time she will generally be able to sing a lower note than the original one and also a higher one, and should sing the words *Do*, *Re*, *Mi*, up and down on these three notes, till they are sung firmly and fairly loudly. If this is difficult, let her sing all three notes up and down on *Do*, afterwards attaining the *Do*, *Re*, *Mi*. In this way, with successive lessons, the scale is managed, after which the patient must learn to intone words, both in ordinary speech and in reply to questions. Later, simple poems are intoned, then prose. When she can sing or intone anything given to her, it is time to start speaking; after she has practised the singing voice for several minutes, we tell her to read instead of sing, starting with a single sentence repeated slowly to dictation. If there is any hesitation, she should return to the singing voice and then try again. After this, she should practise reading aloud regularly at home, but should keep the voice in good order by daily singing.

This treatment, it will be observed, like the treatment by faradism, is fundamentally a matter of suggestion by the physician. Crouch himself apparently recognizes this, for he emphasizes the advisability of isolating the patient from her family and friends, and if possible placing her under the care of a special nurse or companion who will superintend the vocal exercises and see that the patient does not speak except in a resonant voice. He records several cases of cure where ordinary treatment by laryngeal faradism had already failed. His most severe case took ten or eleven days before the patient spoke vigorously; milder cases were restored by two or three séances.

REFERENCE.—*Dub. M. J.*—*Ch. J.* 29, Sept. 1907.

APPENDICITIS, PREVENTION OF. *Robt. Hutchison, M.D.*

Tyson[1] is of opinion that cases of appendicitis are absolutely and relatively increasing; that the ordinary medical or simple cases are not so frequently met with as formerly; and that the type is more often of a grave septic character. He maintains that operation

is treatment "at the wrong end": that what we should aim at is prevention or treatment in the very early stages. He believes that the chief causes of appendicitis are (1) Constipation; (2) Dietetic faults—excessive and unnatural eating and unsuitable foods; (3) Weakened abdominal muscles; (4) A wrong method of stooling. Preventive treatment should embrace (1) Attention to the state of the teeth; (2) Simple and more regular meals, eaten slowly and chewed thoroughly, with rest afterwards; (3) A return to the natural attitude during defæcation; (4) The practice of regular abdominal exercises. An annual washing out of the alimentary canal by "water-drinking" at a suitable spa is probably extremely beneficial as a prophylactic.

Reference.—[1]*Brit. Med. Jour.* Oct. 26, 1907.

APPENDICITIS, SURGICAL TREATMENT OF. (*See also* Peritonitis.)

John B. Deaver, M.D., LL.D. } *Philadelphia.*
Astley P. C. Ashhurst, M.D. }

The main facts of pathology and symptomatology, and the general indications for treatment, are recognized throughout the civilized world with reasonable unanimity; and the main topics for discussion are the diagnosis of obscure forms of the disease, and the treatment of its complications. It does not appear, however, that all surgeons are convinced that there would be no complications if the appendix were invariably removed during the first hours of the attack. During 1907 there were removed in the Episcopal Hospital, Philadelphia, 125 appendices acutely inflamed, but in which the inflammation had not spread beyond the appendix itself; there were no deaths in this series. During the same year 170 similar appendices were removed in the German Hospital, Philadelphia, with two deaths. With a showing such as this it seems strange to us that intelligent surgeons will delay operation, trusting to be warned of impending danger by well-defined symptoms in time to employ an operation, when to our mind the correct time for operation is before alarming symptoms arise. There is still much written about the intensity of the initial pain, the occurrence of an early rigor, the detection of a mass by the third day, or of the inflamed appendix even before this date; but the mere diagnosis of appendicitis is to us an indication for immediate operation. With an experience in appendicitis fairly extensive, we do not yet feel ourselves competent to judge from the outset what the course of an attack is *sure* to be. We are conceited enough to believe that we can recognize, as well as any one else, the occurrence of perforation or suppuration in appendicitis; but we frankly confess our utter inability to feel sure one hour that neither of these events will occur during the next so long as an acutely inflamed appendix remains in a patient's belly. It is possible to argue on probabilities, and to defer operation in cases that appear mild; but sooner or later the surgeon will encounter a case which will make him regret his procrastination, and will convince him that he has lost the life of his patient through over-confidence in his own power of prognostication. Even if life be not lost, it will

surely be jeopardized by the development of peritonitis diffuse or localized, with the possibility of its lethal sequels such as gangrene of the bowel intestinal obstruction, etc.

PATHOLOGY.—Robert F. Morris,[1] of New York states that "the time has arrived when we may, at least tentatively, classify four separate and distinct kinds of appendicitis: (1) Fibroid degenerative appendicitis; (2) Infective appendicitis; (3) Congestive appendicitis; (4) Appendicitis by external invasion." The first class is that originally described by Sem as *appendicitis obliterans*: Morris thinks this form brings more patients to the physician than any other; he states that the change occurs during the course of the normal involution of the appendix; and he bases his diagnosis on the microscopical examination which shows sympathetic nerve filaments caught and compressed in the hyperplastic connective tissue, which gradually replaces all other structures of the appendix. The presence of these nerve filaments, he thinks, serves to distinguish this form from chronic infective appendicitis, since in the latter condition the inflammatory process destroys the nerve filaments as well as the other structures in the wall of the appendix. He says, "At present infective appendicitis is the most conspicuous ailment of the appendix, even though numerically the cases seem to take second place." "Congestive appendicitis occurs with loose kidney and in various conditions causing general obstruction to the lymph and blood circulation of the abdominal viscera. In these cases the swelling develops slowly. There is time for adaptation of the tissues of the tight outer coats to the swelling of the soft inner coats, and the result is very different from that in which rapid swelling leads to compression anæmia," as in infective appendicitis. In the congestive form, Morris continues, "there seems to be no further result than a rather tense and tender appendix, which is amply protected, and which does not have a tendency to go over into the infective appendicitis class, so far as my observation counts." He classifies as appendicitis by external invasion those forms due to tuberculosis or other infections by way of the oviduct.

Trauma as a Cause of Appendicitis.—Vogel[2] reports a case where, following a sudden strenuous twist of the body, symptoms of perforative appendicitis developed. Some weeks later the appendix was found buried in dense adhesions, completely torn into two segments. He quotes Neumann, who is said to have observed trauma as a cause of appendicitis ten times among 152 cases. This far exceeds the percentage occurrence of traumatic appendicitis in our own experience; yet Battle, in a series of thirty cases to be discussed later, found that trauma was the cause in two. Byron Robinson's views that trauma from the iliopsoas muscle is a cause of appendicitis are well known; and no one can deny that such injury, or even direct trauma from blows on the abdomen, might in exceptional cases, be the cause of appendicitis. It does not seem probable however, that any ordinary trauma, which might be produced even by very vigorous twisting or bending of the body, could produce appendicitis in a perfectly healthy organ.

Temperature Changes.—Widmer[3] noted in two patients with appendicitis that the temperature was higher in the right than in the left axilla. In the second patient this difference did not persist throughout the course of a thrombo-phlebitis of the right leg. He therefore sought the explanation of the higher right axillary temperature in uncomplicated appendicitis in a local involvement (through the sympathetic system) of the right thorax following the appendicitis; and thus explained the absence of the difference in temperature between the two sides in such a constitutional fever as that produced by the phlebitis, which evidently acted through the central nervous system.

Propping[4] "calls attention to the difference in the temperature as recorded by the thermometer in the axilla and the rectum. The difference between the two seems to be in inverse proportion to the amount of heat being generated in the muscles either by exercise or chemical processes. The temperature *rose* in the axilla under cold douches, exposure to cold air, and during a chill in sepsis; this was evidently a result, he states, of enhanced chemical processes in the muscles of the axilla. One of the practical conclusions in this research is the discovery that in twenty-five out of 100 patients with appendiceal peritonitis the difference between the temperature in the rectum and in the axilla was exceptionally great—two degrees Fahrenheit, or more—and in this group twelve of the patients died, while only ten died out of the other seventy-five patients. He thinks this shows that a great difference between the rectal and axillary temperature must be accepted as a bad omen, indicating unusually severe peritonitis. The rectal temperature is not high on account of the vicinity of the focus, as no abnormal difference was obtained in certain cases of various other febrile abdominal affections, while it was present in others. The manner of origin of the fever is probably responsible for the varying conditions."

Diagnosis of Chronic Appendicitis.—Handley,[5] in discussing "Invalidism in Women due to Chronic Appendicitis," lays great stress on intermittent enlargement of the right ovary, without true adnexal or uterine disease, as a valuable sign of chronic appendicitis. It is our own opinion, repeatedly expressed, that though chronic appendicitis is a definite pathological entity, it neverthelss requires quite definite symptoms and physical signs for its diagnosis to be made with safety. If no acute attack has occurred, the appendix afterwards remaining in a state of chronic inflammation, we are accustomed to demand for diagnosis the presence of an appendix which can be detected by palpation to be thickened and tender; for we are convinced that in the absence of such physical signs, the removal of the appendix will, in the vast majority of such cases, fail to relieve the patient of her symptoms. Yet where the history of an acute attack can be obtained, we think it is sometimes safe to make a diagnosis of chronic appendicitis when physical signs are very slight or insignificant. We believe the ovary or tube to be involved more often secondarily, than to be themselves the source of infection of a previously healthy appendix; and

we quite agree with Handley that a great many gynæcologists make a diagnosis of chronic oöphoritis or salpingitis when the true lesion is chronic appendicitis.

Operative Technique.—The incision of McBurney meets admirably the indications for most interval operations, or for those operations undertaken before complications have appeared. The simple straight incision splitting the fibres of the rectus muscle is also satisfactory provided an incision of not more than three or four inches is required. But surgeons the world over are coming to regard division of the motor nerves of the abdominal wall as more undesirable even than transverse division of muscle fibres. Kocher and the French surgeons especially have insisted upon the propriety of preserving the abdominal nerves intact, and in America G. G. Davis has devised a transverse incision which enables the surgeon to get as much room as can be obtained by the longitudinal incision but without the injury to the motor nerves which is entailed by the latter unless it is made close to the linea alba. Richards[6] has described the operation employed for many years by W. Gill Wylie, of New York which aims at gaining adequate exposure without injuring the abdominal nerves, and to repair the incision by numerous layers of buried sutures. The skin incision is made over the semilunar line, and the aponeurosis of the external oblique is divided in the same direction and is separated from the sheath of the rectus on the mesial side of the wound; the sheath of the rectus is then opened by a transverse incision, parallel to the fibres of the sheath, the rectus muscle being drawn toward the median line; its posterior sheath and the transversalis fascia and peritoneum are opened in the same direction, and the appendix is delivered. Wylie lays stress on the importance of suturing the various layers of the abdominal wall accurately each to each; he carries this to such an extreme that Richards mentions the following layers for separate suture: (1) Peritoneum; (2) Fascia extending down from the fold of Douglas posterior to the rectus muscle; (3) Anterior sheath of rectus; (4) Thin areolar tissue over sheath "thus is done so that the aponeurosis will slide upon the sheath and not become adherent to it"; (5) Aponeurosis of the external oblique; (6) Areolar tissue; (7) The deep and superficial layers of fascia "this procedure prevents dimpling and spreading of the wound; (8) Skin. It seems to us, although we have had no experience with this incision that it is more complicated and less easily enlarged in case of need than the other incisions which have been devised (Chaput Davis) to meet the same ends.

Treatment of the Stump of the Appendix.—Since the publication of Dr. Wyeth's paper in 1900, there has been an increased interest in this detail of the operation. We never were entirely convinced that in all the cases of intestinal hæmorrhage observed after appendicectomies, the source of the bleeding was the stump of the appendix; but we make it a rule to ligate its base before amputating the appendix, because hæmorrhage from this source is thus effectually guarded against and

because this is the simplest and most expeditious way of disposing of the stump. In all but exceptional cases, however, we are in the habit of burying the ligated stump by suturing the serous coat of the cæcum over it; where rapidity of operation is imperative, or where the application of sutures proves impossible, we merely drop the ligated stump into the abdomen, and have never seen any untoward result from so doing. Be it observed, however, that in nearly all such cases drainage is employed. C. F. Mitchell[7] has reported a case of enterorrhagia following appendicectomy, in which the hæmorrhage was proved by laparotomy to come, not from the stump of the appendix, but from the small intestine.

Barrett[8] has described a method of treating the stump of the appendix for which he claims the following advantages: all the vascular portion of the appendix is tied, the raw edges are turned in, peritoneum being brought into contact with peritoneum without puckering the bowel, "and these advantages are gained through the use of a suture which is easily placed, making the operation safe, and easy of performance." The technique is as follows: "With as small an incision as possible the appendix is secured and freed from adhesions, the meso-appendix is clamped, tied, and cut, so that the appendix stands up directly from the bowel. A number two catgut of good tensile strength is used on a straight or curved needle. The needle enters the tissue at the junction of the bowel and appendix, one-fourth of the circumference from the meso-appendix. It is made to enter the deep structures and yet avoid the lumen, and come out on the opposite side of the appendix. It is then made to enter very close to its exit, to sweep around the opposite side of the lumen in the deep structures, and emerge close to its former entrance. A loop of the catgut is retained opposite the two ends. We now have nearly all the appendix lying outside the suture. The appendix is clamped a little distance above the suture. Another clamp is placed immediately above this, and the appendix cut between the forceps. The ligature is now made to hold the cæcum by traction upon its two ends and the opposite loop. The forceps are now removed and a forked appendix tucker is made to carry the crushed stump into the bowel. At the same time the ligature is drawn down and encircles the tucker, but may be drawn as tight as desired, as the tucker cannot hold on to the stump. All forceps used to invert the stump have a tendency to hold to it and return it. The one-point tucker is worse than useless in dealing with the untied stump, leaving the forceps to be preferred. The operation is completed by overstitching the stump with a continuous Lembert suture, carrying it along the free edge of the mesentery running to the meso-appendix stump, and this suture is tied to one end of the ligature on the meso-appendix."

Treatment of Complications.—Surgeons are very generally agreed that suppurative forms of appendicitis should be subjected to early operation. The principles enunciated by Murphy, namely, small incision, rapid removal of the appendix, and drainage, are daily gaining ground, and the results speak for themselves.

In regard to *abscess* operators differ as to whether it is best to incise the abscess directly, when this is possible, or to open it transperitoneally after protecting the abdominal cavity by the judicious disposition of gauze. Deaver has always been an advocate of the former method, but other surgeons, including Murphy, discountenance it on the ground that leakage into the general peritoneal cavity may occur undetected, either during the etherization of the patient or during such an operation itself. There were twenty-seven operations for appendicular abscesses at the Episcopal Hospital, Philadelphia, during 1907 with no deaths; there were also twenty-seven operations for gangrenous appendicitis in which no distinct abscess existed, without a death. At the German Hospital there were eighty-four operations for localized suppuration from appendicitis, with two deaths.

Battle[9] again raises the question whether the appendix should be removed in all cases of abscess, either at the primary or at a second operation. He concludes that "the treatment of perityphlitic abscess is most safely carried out in two stages: (1) Evacuation of pus and drainage; (2) Removal of the appendix." He thinks the best time for the second operation is when the abscess has recently closed, since the adhesions will be less dense then than later, and those which might prove dangerous in the future can be separated, and further trouble easily prevented. Further experience only seems to convince us that in the immense majority of cases it is much better to remove the appendix at the first operation; and Mr. Battle has himself observed the fact that if it be not removed the sinus may never close. There can be no doubt, we think, that it is always best to remove the appendix subsequently if it has not been removed at first. There will be found exceedingly few cases in which the primary inflammation has entirely destroyed the appendix; though we have had a few such in our own experience.

Gangrenous Appendicitis. Malcolm[10] again calls attention to the clinical and pathological differences between acute appendicitis and gangrene of the appendix, pointing out that the latter, like a slough of the stomach or duodenum, may occur insidiously, and that the histological picture is not always one of acute inflammation. It is for this reason that it is convenient to retain the term "gangrenous appendicitis" as distinct from "appendicular abscess."

Diffuse Peritonitis when operated on early, now presents a mortality so much reduced from what formerly was regarded as unavoidable, that surgeons approach these cases with considerable confidence. The sero-pus which is the product of peritoneal infection is, in its primary form, rich in bacteriolysins and phagocytes, and since this fact has been recognized, and since the practice of indiscriminate irrigation has been abolished, the patients get well with a uniformity which is as surprising as it is gratifying. Murphy[11] is quoted as reporting "forty-three cases of perforation of the appendix into the free peritoneal cavity, with general diffuse, spreading peritonitis." Among

these forty-three cases there were only two deaths, one from pneumonia on the sixth day, the other from intestinal obstruction four days after operation. As is well known, Ochsner[12] does not operate on patients with diffuse peritonitis who come under treatment two days or more after the beginning of the attack; and Murphy[13] states that in the forty-three cases reported by him the period of forty hours was not exceeded from the time of commencement of the diffuse peritonitis until the time of operation. What becomes of the patients in whom operation is deferred, and who are treated by Ochsner's plan, does not appear to have been reported. Ochsner says in a general way that among thousands of such cases so treated by himself and many others, the mortality has been reduced to less than 2 per cent. But what the average surgeon fails to grasp is that Ochsner advocates merely a delay of operation until what he considers a propitious time; he does not profess to cure these patients without operation. When once a spreading peritonitis has been inaugurated, there are several courses which it may pursue: the pus may be free in the general peritoneal cavity, with few or no adhesions; one or more localized abscesses may form; or multiple adhesions may develop, with innumerable pockets of pus, throughout the entire abdominal cavity. If operation is postponed when the patient is first seen, the surgeon must be constantly on the alert to detect any change in the patient's condition; and we firmly believe that many a life is lost by postponing operation because the surgeon is unable to determine the propitious time for intervention; and we further believe that in not a few patients such a time may never arrive, even with the strictest adherence to Ochsner's plan of treatment. In other words, we adhere to the principle previously enunciated: "That until the gravity of the lesions of the general peritoneum exceeds that of the appendiceal condition, a surer remedy for the disease is to be found in removal of the original focus of infection, with drainage of the peritoneal cavity. But when it has become evident that the primary condition—appendicitis—is entirely overshadowed by the secondary condition—peritonitis—and that any operation will only hasten the fatal termination," then we think that Ochsner's so-called starvation treatment, with the head-high (Fowler) position, and proctoclysis by Murphy's method, is the only one which gives these patients even a fighting chance for recovery. We refuse to operate on no patients except those whom we think will die under any circumstances; very occasionally one such patient when treated by the Ochsner method will react sufficiently to be cured by a later operation; the others will die, but we are convinced that any operation would only have hastened the approach of death. We are not aware that statistics have been published by surgeons who routinely follow Ochsner's plan, showing what proportion of patients so treated die without operation. These surgeons are quite ready to report their mortality from operation in the delayed interventions; but it is equally important to know whether there are not some patients in whom operation is postponed who die without operation being

attempted at any time. Acting on the principle that only moribund patients shall be refused operation Dr. Deaver can report for 1907, from the German Hospital, thirty-seven operations for "spreading, diffuse general peritonitis" due to appendicitis, with seven deaths. During 1907, at the Episcopal Hospital, sixteen cases were operated on which were classed as diffuse peritonitis with three deaths; and nine cases classed as general peritonitis, with six deaths. It is our firm belief that in many of these patients who recovered after operation, delay in operation according to Ochsner's plan would have resulted in death; while we are equally sure that in none of the fatal cases could life have been prolonged, much less saved, by resort to this form of treatment.

Nitch[11] reports from St. Thomas's Hospital, London, the result of thirty consecutive cases of appendicitis with diffuse peritonitis. "Since these cases have been treated by early operation and dry sponging or strictly local irrigation, in contradistinction to irrigation of the whole peritoneal cavity, the mortality has fallen from 82 per cent to less than 10 per cent, as the subjoined Table clearly shows." The time elapsing between the onset of acute symptoms and operation was as follows: Under twenty-four hours, three cases, with one death (septicæmia, and general peritonitis); from twenty-four to forty-eight hours, ten cases, no deaths; from fifty-two to sixty six hours, nine cases, no deaths; three days, seven cases, one death (general peritonitis); four days, one case, fatal (pneumonia).

General Irrigation

Operator	Number of cases	Death	Mortality per cent	Reference
Staff of St. Thomas's Hospital	100	80	80·0	*St. Thomas's Hospital Reports*, 1899-1903
Sargent	10	18	94·7	Dudgeon and Sargent: *The Bacteriology of Peritonitis*
Total	114	98	82·3	

Dry Sponging or Local Irrigation

Morton	14	2	14·2	*Brit. Med. Journ.*, January, 1900
Sargent	0	0	0	*The Bacteriology of Peritonitis*
Burgess	33	1	3·03	*Brit. Med. Journ.*, January, 1908
Nitch	30	3	10·0	
Total	83	6	7·2	

These cases were treated by removal of the appendix; careful wiping away with dry gauze of fluid exudate and loosely-attached lymph; counter-opening in the right flank (not in the loin) at position of ascending colon, for drainage; and by drainage, secured by rubber tubes passed, one to the pelvis through the abdominal wound, and the other to the iliac fossa through the incision in the flank; the Fowler position was used, and the patients were turned on their right side in the bed. Continuous proctoclysis was used temporarily in one case. Four very ill patients "received immediate relief from subcutaneous injection of anti-colon-bacillus serum." Three cases were not drained, but in two of these the wound broke open, and thus provided drainage. From his experience with this series of cases, Nitch condemns drainage through the anterior wound, and recommends that it be closed and all drainage be provided through the lateral incision. All the patients received a "large dose of calomel twelve hours after operation, and if necessary this was followed twelve hours later by large turpentine enemata."

Secondary Abscess.—Among Murphy's[15] fifty cases of diffuse peritonitis from all causes, there were seven which had to be re-opened for circumscribed accumulations of pus in various parts of the abdomen; none of these patients died. At the Episcopal Hospital (1907–08) Ashhurst operated on eight patients with diffuse peritonitis due to appendicitis; three of these developed secondary abscesses; in two patients the abscesses were successfully evacuated, but in the third an abscess between the uterus and the bladder was found only at the post-mortem examination, this patient being the only one of the series to die. A fourth patient developed a subphrenic abscess three months after removal of the appendix, and has now recovered from his second operation. At the German Hospital during 1907, Deaver has encountered two cases of secondary abscesses among thirty-seven cases of diffuse peritonitis, both patients recovering..

Cystic Degeneration of the Appendix.—Rushton Parker[16] removed at operation an appendix with large lumen, and with its distal end distended by pasty matter to the size of a walnut; the interior of this cystic portion was largely deprived of mucous membrane, the wall consisting of little more than peritoneum. The contents were examined by Dr. O. T. Williams, who found them to consist of calcium carbonate, fat, and calcium salts. He adds that the probable explanation of the condition is that the calcium soaps formed in the submucosa and mucous membrane were excreted into the lumen of the appendix, and thus dilated it; later the calcium soaps still further decomposed, producing a certain amount of calcium carbonate. Unfortunately no account of the microscopical examination of the walls of the appendix is given.

Diverticulum of the Appendix.—Johnston[17] reports such an appendix removed at operation, and refers to twenty-five similar cases collected by Herb.[18]

Carcinoma of the Appendix.—This subject has been reviewed by

Harte,[19] who collected 161 cases, nine of which had not been previously reported. He has himself encountered four cases at operation, as well as one at autopsy. He thinks that careful microscopical examination should be made of every appendix removed, and that under such circumstances from 0·33 to 1 per cent of specimens removed at operation would be shown to be carcinomatous. Two classes of carcinomata of the appendix may be recognized, the columnar-celled type and the spheroidal-celled, which latter closely resembles the basal-celled epithelioma of the skin. In the latter class may perhaps be included many cases described as endothelioma or sarcoma. The columnar-celled carcinoma is much more malignant, occurs in patients of forty years or older, is prone to invade the cæcum, and to recur after excision. The spheroidal-celled tumour, on the other hand, is relatively benign, occurs in patients of less advanced years, and has little tendency to recur. As a rule neither type presents distinctive clinical features, and operation is undertaken for symptoms of chronic or acute appendicitis, more frequently for the former. Harte considers previous inflammation a predisposing cause, and urges this factor as an additional argument for the removal of all offending appendices as soon as possible. Abstracts of all the collected cases are appended.

Le Conte[20] reports a case of intussusception of the appendix, which was removed; microscopical examination showed carcinoma, and a later operation was done, removing the lower ileum, the cæcum, and enlarged lymph nodes which had been noted at the first operation. The case is included in Harte's statistics. A. O. J. Kelly[21] adds three cases of carcinoma, and one of endothelioma, to the six tumours of the appendix previously reported by him. Kelly has studied microscopically about 2500 appendices removed at operation by Deaver, and among this number found five cases of primary carcinoma and two cases of primary endothelioma. He traced two patients ten years after operation, and found them free from recurrence; the cases in the second series are too recent to make their subsequent history of value.

McWilliams[22] collects 105 cases of undoubted primary carcinoma of the appendix including three previously unpublished. Sixty-three patients (83 per cent) were operated on for appendicitis. Of these, twenty-three (36·5 per cent) had the appendix removed for the first acute attack of appendicitis; thirteen (20 per cent) had chronic symptoms without an acute attack; five (8 per cent) had chronic symptoms with one or more acute attacks; and twenty-two (35 per cent) had the appendix removed on account of recurrent attacks. McWilliams thinks that the growth was the cause of the attacks, acting in a manner similar to a concretion; but as symptoms have existed for over a year in twenty-one cases (more than 21 per cent), it seems probable that chronic inflammation paved the way for the development of the carcinoma, especially as 61 per cent of the patients who were operated on during the first attack presented chronic lesions of the appendix. Collecting various statistics, McWilliams finds that twenty-six carcinomatous appendices were detected in 6505

subjected to microscopical examination, or in 0·4 per cent of cases. He further found that in over 59 per cent of all the cases the tumours were situated at or near the tip of the appendix, and in 76 per cent were located at, or distal to, the middle; showing, he thinks, the effect of inflammations predisposing to the development of cancer, since the majority of strictures, ulcers, etc., occur towards the tip. In only 55 per cent of the cases were visible tumours present when the appendix was removed; and in 33 per cent no sign of the tumour was detected by macroscopical examination, even after splitting open the appendix. Spheroidal-celled cancers he found 30 per cent more frequent than the columnar-celled type; and the average age for the former was 23½ years, for the latter 43½ years. Thirteen patients, or 16 per cent of those operated on, were well more than three years after operation; twenty-one (26 per cent) were well more than two years later; in only one patient (1·2 per cent) is the tumour definitely known to have recurred (Lejars).

Sarcoma of the Appendix.—Harte,[23] in his review of carcinoma of the appendix, states that he was able to collect six cases of sarcoma affecting the appendix; he thinks it probable "that many cases described as endothelioma and sarcoma are in reality instances of spheroidal-celled carcinoma."

REFERENCES.—[1]*Jour. Amer. Med. Assoc.* 1908, ii, 644; [2]*Münch. Med. Woch.* June 9, 1908; [3]*Ibid.* Mar. 24, 1908; [4]*Ibid.* Mar. 10, 1908, in *Jour. Amer. Med. Assoc.* 1908, i, 1314; [5]*Clin. Jour.* Mar. 25, 1908; [6]*N. Y. Med. Rec.* Oct. 19, 1907; [7]*Ann. Surg.* Oct. 1908; [8]*Ibid.* Feb. 1908; [9]*Lancet*, July 11, 1908; [10]*Ibid.* June 6, 1908; [11]*Jour. Amer. Med. Assoc.* 1908, ii, 650; [12]*Ibid.* 648; [13]*Surg. Gyn. and Obst.* 1908, vi, 597; [14]*Lancet*, June 20, 1908; [15]*Surg. Gyn. and Obst.* 1908, vi, 596; [16]*Brit. Med. Jour.* June 6, 1908; [17]*Surg. Gyn. and Obst.* June, 1908; [18]*Jour. Amer. Med. Assoc.* 1907, xlix, 2135; [19]*Ann. Surg.* June, 1908; [20]*Ibid.*; [21]*Amer. Jour. Med. Sci.* June, 1908; [22]*Ibid.*; [23]*Ann. Surg.* June, 1908.

APPENDICOSTOMY. (*See* STOMACH, SURGERY OF.)

ARTERIES. *John Cowan, D.Sc., M.D.*

Arterial diseases continue to attract attention from the pathological standpoint. Rickett[1] and Klotz[2] describe the result of experiments with adrenalin chloride, barium chloride, digitalin, *B. typhosi*, diphtheritic toxins, etc. Marmorstein[3] discusses influenzal aortitis, and Klotz[4] congenital syphilitic aortitis. Thayer and Fabyan[5] consider the conditions found in the radial artery, and Fremont Smith[6] arterial changes in the young. Askanazy's paper[7] contains his opinions on the etiology and pathology of arterial disease as a whole. Periarteritis nodosa is discussed by Benedikt,[8] Benda,[9] and Carnegie Dickson.[10] The former diagnosed the condition during life. Rogers[11] describes a series of cases of atheroma and dilatation of the pulmonary arteries, without marked valvular lesions, which he has observed in Bengal. All the evidence which is accumulating points to the importance, in the production of arterial disease, of the infections and the intoxications as well as the other better known factors.

Cheinisse[12] draws attention to the *gastro-intestinal symptoms* which may occur from such causes. Complete obliteration of mesenteric vessels is of course followed by colic, melæna, and peritonitis, but ulceration, most frequently in the large bowel, and rarely widespread and multiple, may also ensue from lesser lesions. Buch considers that some cases of paroxysmal abdominal pain may be due to similar conditions and so analogous to angina pectoris. In these cases morphia, belladonna, etc., are of little value, but **Strophanthus** and **Theobromine** speedily relieve the symptoms. Perutz's paper[13] also considers the paroxysmal abdominal attacks of arteriosclerotic patients. He considers that they are due to vasomotor spasm still further restricting the already defective blood supply of the parts.

Stengel[14] discusses the *nervous manifestations* which may occur in arteriosclerosis. He points out that such patients often suffer from organic lesions in the brain, heart, or kidneys, and emphasizes the difficulty which exists in such cases in apportioning the results to their proper causes. Sudden occlusion of a large peripheral vessel produces, as a rule, extreme pain, and more or less loss of power, in the parts supplied. In time the symptoms abate, but the palsy may be permanent. Pallor, coldness, tingling, cramps, lividity, and œdema may all co-exist. The latter symptoms are not infrequently present in aged arteriosclerotics without any definite arterial obstruction, and although some writers have suggested that they are due to an arteriosclerotic neuritis, Stengel doubts whether the intervention of a neuritis is a frequent, not to mention a necessary, condition. In the paroxysmal affections—erythromelalgia, Raynaud's disease, and intermittent claudication—the vasomotor phenomena suggest a reflex nervous origin, and in cases where marked arterial changes are present the reflex may have its origin in the arterial disease. He thinks that abdominal pains and even backache may be due in some instances to a diseased abdominal aorta, and agrees with Sir Clifford Allbutt's theory that some cases of angina pectoris are related to aortic rather than to cardiac disease. Experimental evidence shows that cerebral symptoms of varying kind may be due to cerebral anæmia and such symptoms as convulsions, petit mal, stupor, coma, vertigo, temporary aphasia, ocular disturbances, and tinnitus, as well as psychical disturbances, may all owe their appearance to disease, more or less widespread and extreme, of the cerebral vessels. Reynolds' paper[15] on *Intermittent Limp* records five cases of this remarkable and interesting affection, and reviews the whole question.

Levin[16] reports a case of *Spontaneous Gangrene of the Foot.*

Huchard[17] distinguishes four clinical stages in *arteriosclerosis.* In the first presclerosis an intoxication with renal and hepatic insufficiency and high arterial pressure obtains: in the second—cardio-arterial—arterial lesions have resulted: in the third—mitro-arterial—the mitral valve has become incompetent: and in the last stage, cardiac dilatation has ensued. It is important to recognize the presclerotic stage, for the disease is still curable, but a *régime and not any particular drug* can alone effect good results. The intoxication

must be combated by a simple milk or lactovegetarian diet, **Theobromine** (in cachet, 40–50 cgrams), and a glass of **Evian-Cachat** or **Vittel** water every morning. **Blood-letting, Massage, Gymnastic Exercises, Baths,** etc., are useful adjuncts. Treatment in the second stage is still mainly eliminative, but the arterial pressure is now permanently above normal, though it can generally be lowered to some extent with benefit. The chloride intake should be cut down, and vasodilators such as the **Iodides** and **Nitrites** administered. In the third stage he considers that a **Milk Dietary** is absolutely necessary, with **Theobromine** and **Digitalis** as adjuvants. In the last stage the cardiac stimulants are of less value, but bleeding is often helpful. The intake of fluids must be cut down. In the diabetes of arteriosclerosis the latter must be treated, and the glycosuria relatively disregarded.

Minkowski[18] agrees with Huchard that the presence of arteriosclerosis demands careful regulation of all the patient's habits. Excessive fatigue must be avoided, but a moderate amount of exercise is often of value unless any special cardiac weakness demands a complete rest for a time. The diet should be mixed and not too bulky, easily digested, not highly spiced, and containing a moderate amount of meat. It is useless to pay attention to the lime content of the food. Small doses (3 to 7 gr.) of **Potassium Iodide** are often useful when administered over long periods.

Senator[19] considers that tea, coffee, meat extractives, and tobacco, may all, if taken in excess, produce arterial lesions. Intestinal putrefaction must be avoided, and a lactovegetarian diet is generally desirable. He has found **Iodipin** (Cf. Kalmus, *Fol. Therap.*, July, 1908) in capsule (15 gr. t.i.d.), and **Sajodin** in tablet ($\frac{1}{2}$ gr., four to six times daily) of use. Parisi and Danio recommend **Iothion** in cases where the alkaline iodides are not well borne.

Winternitz[20] discusses the physical and dietetic treatment.

Martinet[21] recommends the following mixture as a daily drink in arteriosclerosis so as to prevent calcification of the vessels by eliminating the lime salts :—

R	Sodii Carb.	10·0 grams	Syrupi	10·0 grams
	Acidi Lact.	q.s. ad sat.	Aquæ	200·0 ,,
	Acidi Lact. (extra)	10·0 grams		

Riviere[22] discusses the treatment of arteriosclerosis by **Physicotherapy,** and describes the methods in which he trusts. He has found Lauder Brunton's matutinal powder very useful when taken every morning in a large glassful of water :—

R	Potass. Bicarb.	2·0 grams	Sodii Nitritis	0·3 gram
	Potass. Nitratis	1·20 ,,		

Winternitz[23] considers the treatment of arterial disease by baths and diet.

Arterial Hypertonus, Sclerosis, and Blood-pressure (Wm. Russell, Edin., 1907).—Dr. Russell's views on arterial disease and hypertonus are already well known, and are elaborated in this volume. The chapters

on the influence of the alimentary system on the arteries, on angina pectoris, and on cerebral arterial disease are particularly interesting and instructive. His general conclusions have been criticized by G. A. Gibson [24] to whom he has replied [25].

REFERENCES.—[1] *Lancet*, Dec. 21, 1907; [2] *Quart. Journ. Med. Science*, Oct. 1907; [3] *Brit. Med.* Mar. 30, 1907; [4] *Journ. Path. and Bact.* 1908; [5] *Edin. Journ. Med. Sci.* Dec. 1907; [6] *Brit. Med.* Feb. 1908; [7] *Ther. Monats.* 1907, No. 9; [8] *Münch. med. Woch.* Feb. 11, 1908; [9] *Berl. klin. Woch.* Feb. 17, 1908; [10] *Proc. Path. and Bact.* 1908; [11] *Quart. Journ. Med.* Oct. 1908; [12] *Edin. Med. Journ.* Dec. 11, 1907; [13] *Münch. med. Woch.* May 28, 1908; [14] *Brit. Journ. Med. Sci.* Feb. 1908; [15] *Med. Chron.* Nov. 1907; [16] *Med. Rec.* April 11, 1908; [17] *Journ. de Prat.* Sept. 28 and Oct. 5, 1907; [18] *Ther. Monats.* 1907, No. 9; [19] Ref. in *Centr. f. inn. Med.* Sept. 14, 1907; [20] *Ther. d. Gegenw.* April, 1908; [21] *Presse Méd.* Oct. 2, 1907; [22] *Méd. Press*, Mar. 18, 1908; [23] *Centr. f. inn. Med.* June 13, 1908; [24] *Edin. Med. Journ.* 1908, xxiii, p. 539; [25] *Ibid.* 1908, N.S. 1, p. 47.

ARTERIES, WOUNDS OF. (*See* NECK, WOUNDS OF.)

ARTERIOSCLEROSIS. (*See* ARTERIES.)

ARTHRITIS, GONORRHŒAL. (*See* GONORRHŒAL ARTHRITIS OF KNEE.)

ASTHENOPIA.

Brit. 1908, pp. [illegible]—He is sometimes an accompaniment of nasal obstruction [illegible] *adenoids* or *nasal polypi*. Treatment directed to this leads to an improvement in vision.

ASTHMA. *Joseph J. Perkins, M.A., M.B., F.R.C.P.*

Treatment by Diet.—Rabagliati[1] looks upon asthma as a process by which nature eliminates unnecessary material from the body, and which therefore is to be met by anticipating nature's effort and reducing the intake. Excess of carbonaceous food is the chief agent, but excess of any sort of food is harmful. He allows little more than one meal a day, and that at noon; in the early morning a cup of weak tea, and again at 5 p.m.; at 7 p.m. a cup of Allen & Hanburys' food or Horlick's malted Milk or Maltine with milk. By means of this *régime* he cured an inveterate case of bronchial asthma in a man of 25, in whom the attacks had recurred every few weeks from the age of two and had led to marked emphysema.

Tucker's Asthma Cure.—Einhorn[2] as the result of repeated analyses, found the chief ingredients in this remedy to be: Cocaine 1 per cent, nitrous acid 2·6 per cent, glycerin 30 per cent.

Analysis failed to detect *atropine*, but physiological experiment showed its presence. Inhalation mixtures of 1 per cent cocaine with varying quantities of sodium nitrite and atropine were uncertain in their results; he was led, therefore, to prepare in a pure crystalline condition the nitrites of atropine and cocaine. A mixture of these salts in the following proportions, used with a fine spray for inhalation, gave very satisfactory results:

Cocaine Nitrite	1·25 per cent	Glycerin	25·0 per cent
Atropine Nitrite	0·25 „	Water	73·5 „

The mixture can be obtained from Dr. Albert Bernard, Berlin, Kurstrasse 34.

REFERENCES.—[1]*Med. Press*, June 24, 1908; [2]Brockbank, *Med. Chron.* Jan. 1908.

BACILLURIA. (*See* URINE.)

BALDNESS. (*See* HAIR.)

BANTI'S DISEASE. *J. G. Emanuel, B.Sc., M.D.*
L. G. J. Mackey, M.D.

It is now fourteen years since Banti described the disease which has since borne his name, a disease characterized by what may be described as a first stage lasting over six or seven years, during which a progressive enlargement of the spleen is accompanied by an insidious but progressive anæmia; a second stage of shorter duration than the first, marked by digestive troubles and especially diarrhœa; and a third and final stage, marked by accentuation of the anæmia, and symptoms typical of cirrhosis of the liver, ascites, and sometimes jaundice. The results of autopsies show the final condition to be one of hypertrophy and sclerosis of the spleen and a form of hypertrophic cirrhosis of the liver; and the view generally held is that whatever the cause of the enlargement of the spleen may be, the cirrhosis is a secondary condition due probably to the irritation of the liver by substances conducted from the spleen by the portal vein.

But there have not been wanting observers who regarded the disease as merely a form of cirrhosis of the liver in which the splenomegaly preceded the symptoms of cirrhosis; and others again have reported cases which seem to point to both the splenomegaly and cirrhosis being the result of some general infection such as malaria. Drs. Oettinger and Fiessinger[1] publish two cases which afford valuable evidence in favour of the secondary character of the cirrhosis. They might well be described as cases of Banti's disease which proved fatal before the condition of hepatic cirrhosis was well established. Both were cases of splenomegaly occuring in late middle life and terminating after an illness of several years' duration, the final stages being marked by jaundice, ascites, and diarrhœa. In both, the autopsy showed a hypertrophic sclerosis of the spleen, a chronic endophlebitis of the splenic vein and its tributaries in the substance of the spleen, and also an endophlebitis of the portal vein and of its terminal branches in the liver. The liver showed no typical cirrhosis, but there was a well-marked periphlebitis around the branches of the portal vein spreading into the neighbouring liver cells—in other words, an early portal cirrhosis.

It may be urged that the absence of definite cirrhosis throws doubt on the diagnosis of the cases, although the symptoms during life were typical; but it seems much more reasonable to accept the diagnosis as correct and regard the cirrhosis as of a very early character, while the splenomegaly was obviously of many years' duration; at any rate

the splenomegaly cannot be in any way secondary to the cirrhosis of the liver.

The pathology of Banti's disease is not understood but it is possible that the enlargement of the spleen is secondary to some changes of a hæmolytic nature in the blood, that toxic substances borne from the spleen to the liver in time produce an endophlebitis of the splenic and portal veins, and finally a periphlebitis around the branches of the portal vein in the liver, which eventually leads to a definite cirrhosis.

The part played by the spleen in this disease is not merely a matter of scientific interest, but also concerns the treatment of the condition; for if the spleen be primarily at fault, then it might be expected that a good result would follow its removal, and in fact there are already a number of cases on record in which **Splenectomy** has been followed by a complete cure. But it must be borne in mind that such an operation cannot be successful in the later stages of the disease, and moreover, before thinking of surgical intervention in such cases, the diagnosis must be carefully established, for in many forms of splenomegaly—such as in leukæmia and lymphadenoma—splenectomy has been followed by most disastrous results.

REFERENCE.—[1] *Rev. de Méd.* Dec. 1907.

BERI-BERI. *J. W. W. Stephens, M.D.*

F. Tsuzuki[1] brings forward facts which he claims definitely dispose of the rice-intoxication theory of beri-beri; e.g., in two divisions of the Japanese army, living under practically the same conditions, and using the same rice, in one there were 1127 cases, and in the other 161, a fact which the author considers is incompatible with the rice-intoxication theory. The difference is to be explained by *infection*, which in this case was afforded by the soldiers returning from the war. The author still believes in his coccus (*Year Medical Annual*, 1907). The disease he considers to be an infectious one while the symptoms are intoxicative. Rice is only a predisposing cause.

REFERENCE.—[1] *Mitt. d. Schiffs u. Trop. Hyg.* 1908, No. 12.

BILIARY COLIC.

(*Vol.* 1892, p. 286; *Vol.* 1893, p. 273)—Good results are said to follow dosage with **Olive Oil, Sodium Salicylate,** or **Pilocarpine** hypodermically. Heat may be applied in the form of a bath with a gradually rising temperature. **Morphia** may be given subcutaneously; or **Opium Suppositories,** which are particularly useful for patients with severe vomiting. A prescription for a suppository follows: Extr. Belladonnæ. Extr. Opii ā gr. ½. Ol. Theobromæ 3iss: M. ut fiat suppository.

BILIARY TRACT, SURGERY OF. (*See* GALL-BLADDER.)

BLACKWATER FEVER. (*See* MALARIA.)

BLADDER, TUMOURS OF. *F. Harry Fernand, F.R.C.S.*

C. Mayo[1] devotes attention to transperitoneal removal of tumours of the bladder. He admits that with modern methods of research an accurate diagnosis can be arrived at, but that curative treatment lags behind. Sedgwick Watson's statement that operations in 1886

per cent of benign, and 46 per cent of carcinomatous, growths of the bladder have been surgical failures, and Frisch's statistics,[2] showing that two-thirds of all bladder tumours are malignant, emphasize the necessity for early diagnosis and the choice of a method of approach so that radical operations may be the rule and not the exception. Clinically there occur: (1) Tumours with a pedicle: (2) Those with a broad base of attachment to the mucosa: (3) Those which involve the whole thickness of the bladder wall. The third variety may by continuity of tissue involve other organs—the prostate, ureter, urethra, or adjacent abdominal structures. Very large areas of the bladder—two-thirds or more—can be resected, and the remainder will regenerate and dilate to a considerable extent, often forming a very serviceable organ, as pointed out by Harris[3] in 1902.

Mayo makes three points: (1) He reiterates the acknowledged fact that the lymphatics of the bladder are few and inactive, which delays metastasis of malignant tumours, rendering them for a considerable period a local disease; (2) He states that carcinoma confined to the bladder may be looked upon as curable by operation; and (3) He asserts he is not satisfied with the ordinary suprapubic incision in operating upon large tumours of the bladder, as, while several cases did exceedingly well, in two instances of cancer he not only failed to cure the local condition, but unfortunately transplanted the disease to the abdominal wall and space of Retzius. The usual result of imperfectly removed cancer is not only that relief is temporary, but the growth of the recurring tumour is usually more rapid, and the condition of the patient, if anything, is worse than before the operation.

Operation.—He advises the following: The patient is placed in the high Trendelenburg position, and a median incision made from the pubes upwards for six inches or more. The pelvis is well packed with gauze pads, which hold the intestines in the upper abdomen. The abdominal incision is also protected by gauze pads. The bladder is caught by two tenaculum forceps, lifted into the wound, and opened by a two-inch median incision. The small amount of fluid in the bladder is absorbed with gauze, and the incision is enlarged upward and downward until it is ample for the purpose. The tumours may be cut from the bladder with scissors and the denuded area burned with cautery.

Malignant growths involving the lower half of the bladder can be raised with tenaculum forceps and resected with a Pacquelin cautery. The area removed should include healthy mucosa surrounding the tumour. No sutures are required to close these areas, the space being allowed to cicatrize.

When malignant growth necessitates the removal of a great part of the bladder, it is divided and removed freely, whether covered by peritoneum or not. In making the incision, one-third to one-half inch of tissue about the urethral entrance should be preserved if possible. If the bladder be involved at the ureteral opening, after the diseased portion of that viscus is removed, it is divided near the

bladder and drawn into the abdomen through a perforation in the peritoneum close to the remaining half of the bladder, into which it is passed and where it is attached with catgut sutures. The peritoneum is closed over the exposed ureter in a fold by a few sutures, a method which insures rapid healing. The remaining portion of the bladder is now closed, often forming a greatly reduced but serviceable viscus.

The bladder wound, regardless of its size, is closed by a through-and-through continuous suture of catgut introduced in the original Connell method. This stitch is a running mattress suture, and is passed through the entire thickness of the bladder wall, all loops pulling from the mucous side, and, when drawn close, making a complete air-tight and water-tight continuous mattress stitch. The line of suture is now protected by a suture of silk, or preferably linen, applied as a Cushing parallel peritoneal suture, taking a square bite of the peritoneum first on one side then on the other of the line of closure, the needle being inserted parallel with the incision. This suture approximates the peritoneum and protects the primary suture just as when it is employed in gastrojejunostomy, and is used for the closure of all the bladder incisions and resections regardless of the amount removed.

Should the bladder incision pass forward of the peritoneal fold, the closure will be the same, and is accomplished by drawing the bladder toward the abdomen and carrying the peritoneal fold to a lower level; the advantage of securing early peritoneal adhesions being developed to the fullest extent. As a rule the abdominal wound is closed without drainage, but should the general cavity of the peritoneum become soiled, a temporary drainage could be made through a stab-wound. The bladder is catheterized at regular intervals for the first few days following the operation, if it is necessary, but as a rule the patients void their urine at frequent intervals with little distress.

Bilateral Ureterostomy for the Relief of Inoperable Cancer of the Bladder or for short-circuiting the Urine prior to Removal of the Bladder.—It was noticed in the *Annual* of last year that Watson had carried out drainage of both kidneys through a lumbar incision in order to divert the urine from the cancerous bladder, and that Rovsing had suggested ureterostomy for the same object. Acting on these suggestions, Hurry Fenwick[1] performed bilateral ureterostomy, considering it the less severe operation. Instead, therefore, of incising both kidneys, he made a small transverse incision over both iliac crests, and brought out the ureters on to the loin. His later work has proved, however, that when the ureters are brought out in front at the appendix region, the subsequent dressing is easier for both patient and nurse. This simple expedient—for it is simple in expert hands—is admirable in affording instant and great ease from suffering, and that without shock. The rationale is, of course, the same as that of colotomy in inoperative cancer of the rectum.

Fenwick asserts that short-circuiting the ureters is the secret of a successful **Cystectomy.** It does away with one of the greatest

elements of failure in the entire removal of the bladder—and in many instances early removal of the bladder, when soft carcinoma attacks that organ, is the only real chance a patient has of cure. It will prove of infinite service in recurrent cases of soft luxuriant villous vesical papi loma, with its power of bleeding and its capacity of obstructing urination without killing the patient.

With a preliminary ureterostomy Fenwick feels certain he can now remove a bladder without the certainty of a fatal issue, if ordinary *vis* is present. He adduces three successful cases.

The technique of excision of the bladder is simple *if the viscus is not adherent*. Its secret consists in the operator using a strong electric head lamp, appropriate retractors, and in shelling out the *distended* bladder without opening it except at the vesical orifice, by keeping strictly to the outer muscular layer of the organ. A vertical skin and a transverse muscle incision are made suprapubically. The bladder being brought into view, the posterior aspect is first separated by scissor-clipping from the peritoneal layer as far down as the posterior border of the prostate (*Fig.* 11). The separation proceeds *between the prostate and the bladder* base until the trigone is reached. If there is any suspicion of cancer, the vesicles and prostate must be removed also, and in this case the shielding hand protects them from the rectum, while the scissoring continues. The anterior surface is now separated from the pubes as low as the prostate (*Fig.* 12). With a little tactile dexterity the scissors (a broad-bladed pair) can be made to cut cleanly through the vesical orifice—if the prostate may be left—and the trigone. The freed bladder is now lifted on to one side to allow of the ureters being traced; these are detached a little way up and divided. If the prostate has to be ablated, the scissors aims lower and cuts through the membranous urethra to join the posterior incision.

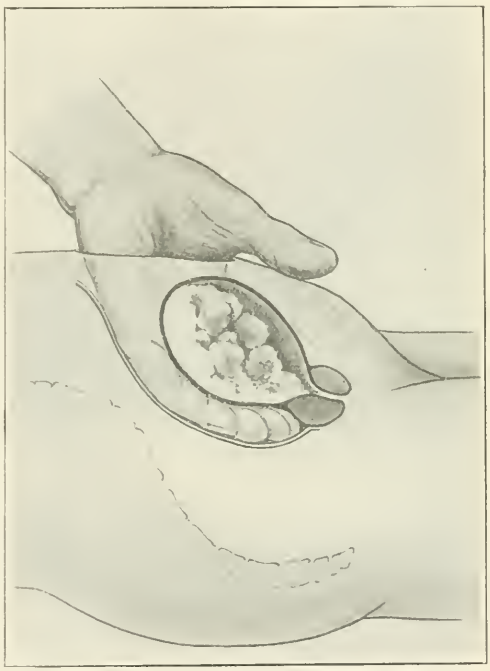


Fig. 11.

If the posterior upper wall is invaded and the peritoneum involved, this must be taken freely away, and flaps of peritoneum brought up from adjacent areas.

Excision of the bladder for cancer is not one that a novice in surgery had better undertake. It often entails much patience and great skill to avoid tearing open vessels and bowel. Moreover, a false diagnosis of cancer of the bladder and excision on a false premise would bring unthinkable discredit on surgery and untold misery to the patient.

Cancer of the bladder originates most often at the base and spreads towards the back of the bladder, involving the peritoneum; it is often latent for months, and therefore reaches the surgeon late in the course of the disease.

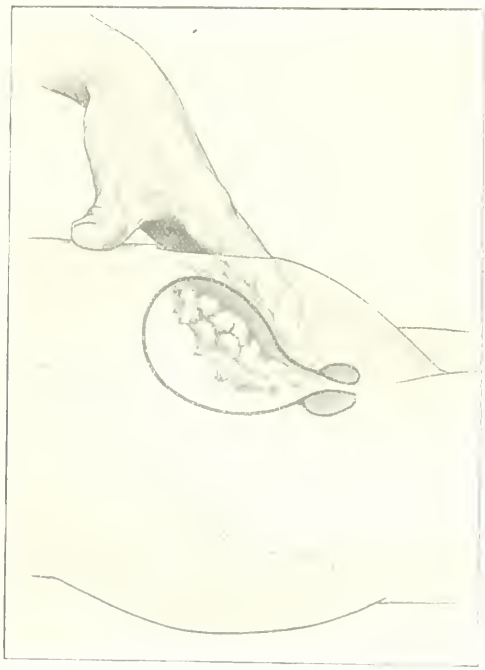


FIG. 1.

Lastly, although it is a matter of tradition and belief with surgeons to regard the disease as rarely disseminating early, there is reason to believe that the extensions and secondary deposits are insidiously formed quite early. For these many reasons excision cannot be looked upon as an operation likely to be frequently needed or indeed advised.

Fenwick[1] submits the following propositions for consideration: (1) What can be done for uncontrollable and luxuriant benign villous growth of the bladder in which the patient suffers from exhausting hæmorrhage or uncontrollable pain, or is commencing to suffer from ascending septic changes along the ureters? In such a case he agrees that bilateral nephrostomy, or better still anterior ureterostomy, should be performed, and a fortnight later the bladder should be removed—if the patient's physical condition and future seem to permit of this mutilation. (2) If the bladder is affected by interstitial cancer, which has so invaded the surrounding areas that no chance remains of removing the organ, he submits that bilateral ureterostomy is often wiser, for a suprapubic tube often adds to the vesical spasm. The short circuit of the urine will relieve the patient

of the agony of urination. (3) If malignant disease is detected early, as it can be by the cystoscope, it is wiser to perform double ureterostomy; and if the physical and renal condition of the patient permit, let the bladder, with or without the prostate and seminal vesicles, be entirely ablated.

REFERENCES.—[1]*Ann. Surg.* July, 1908; [2]*Wien. klin. Woch.* 1907, No. 40; [3]*Ann. Surg. Oct.* 1902; [4]*Brit. Med. Jour.* June, 1908; [5]*Ibid.* July 4, 1908.

BLOOD-PRESSURE. *John Cowan, D.Sc., M.D.*

Williams[1] discusses the value of blood-pressure determinations, and thinks that instrumental readings are of great value. He points out that the normal increase (six to ten beats) in the pulse-rate on assuming the erect position is intensified if the pressure is low, and may be absent if the pressure is high. The reverse of the normal reaction—a lower rate while standing—indicates widespread arterial disease, and a permanently high blood-pressure. Blood-pressure observations are often of value from the therapeutic standpoint, the dyspnœa of effort in goutiness, for example, being associated with a high pressure and suggesting eliminative treatment, while that of phthisis with a low blood-pressure requires stimulation.

Vere Hodge[2] considers that increased arterial pressure (hyperpiesis) is the result of increased peripheral resistance, and may be either temporary or permanent. The temporary cases are due to arteriolar spasm, and with its disappearance the pressure regains the normal. Permanent hyperpiesis occurs in arterio-renal sclerosis, and is mainly necessary and permanent. Toxic causes may, however, still further increase the pressure, and can often be removed with benefit to the patient.

G. A. Gibson[3] discusses the clinical value of blood-pressure determinations in acute and chronic disease. Their value in cases of aortic regurgitation, for example, is considerable. In these cases the systolic and diastolic pressures may vary considerably, the "pulse-pressure" sometimes exceeding the diastolic pressure (systolic pressure 190 mm., diastolic pressure 80 mm., "pulse-pressure" 110 mm.) and the prognosis is in consequence much more grave than in cases with a "pulse-pressure" approaching the normal (30 to 60 mm.) as the figures represent the severity of the lesion from the mechanical point of view. In cases of heart block the pulse-pressure may also be high (systolic pressure, 270 mm., diastolic pressure, 80 mm.), as the long diastole allows the pressure to fall to a low level, even although the ventricular output is large.

Potain stated that the blood-pressure in diabetics was increased, but other observers have questioned his results. Elliott[4] has estimated the blood-pressure in twenty-five cases, and finds no constant data, the blood-pressure being sometimes low and sometimes high. He concludes with Janeway that the effect on blood-pressure is slight, and that other causes than the diabetes produce the observed results. Laqueur[5] discusses the practical bearing of blood-pressure determinations in physical therapeutics.

G. A. Gibson[6] has devised an instrument (*Fig.* 14) for the graphic

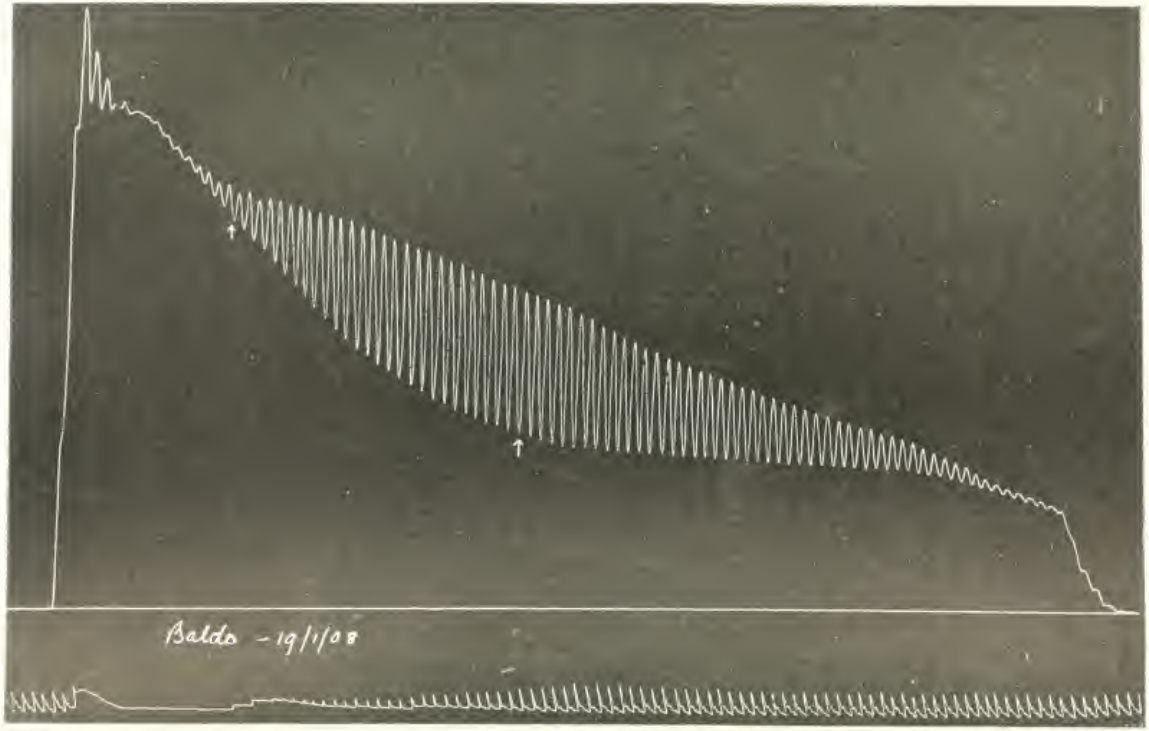


Fig. 13. Tracing of Blood-pressure taken by rapid inflation and gradual escape with quickly revolving cylinder. It shows systolic pressure to be 170, and diastolic pressure 106. This figure is reduced in size. In the original, the height above the base line marks the pressure. As the manometer is U-shaped the number of millimetres must be doubled, so as to obtain the absolute pressure. (G. A. Gibson.)

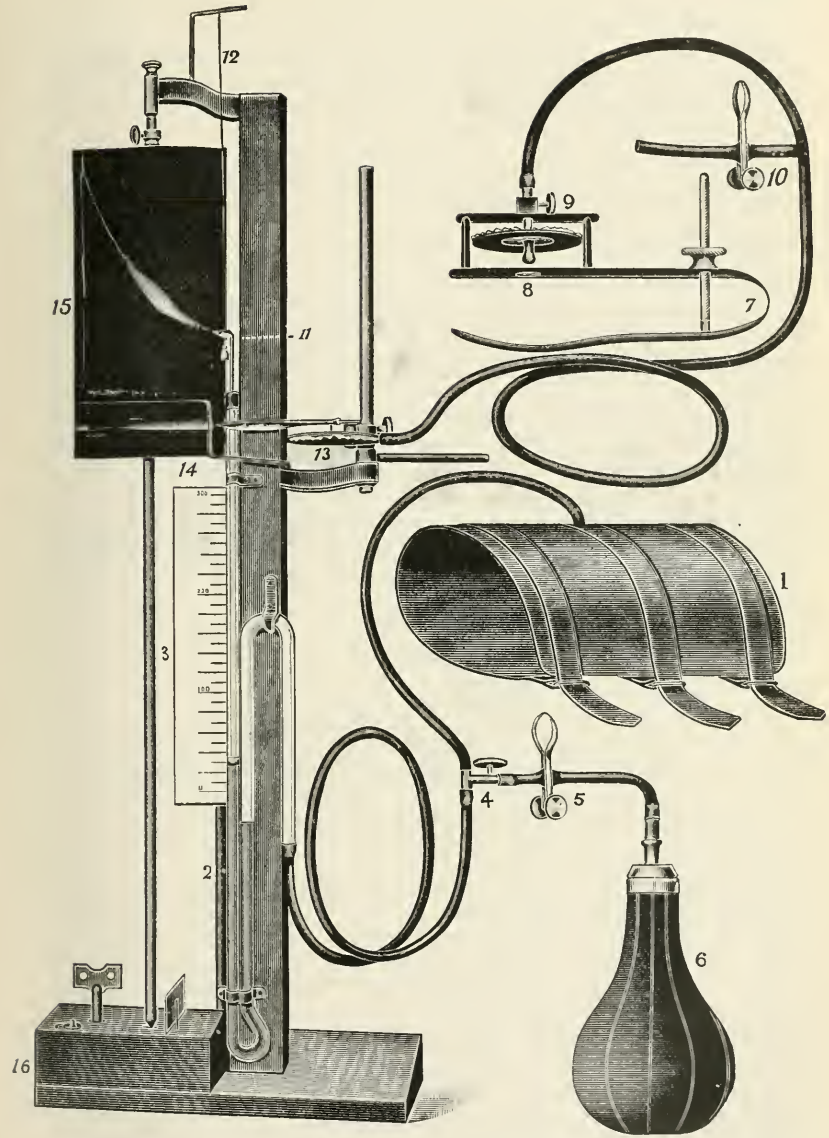


Fig. 14.—G. A. Gibson's Sphygmomanometer for recording absolute records of the arterial pressure. 1, armlet ; 2, manometer ; 3, scale ; 4, valve for regulating pressure ; 5, clip, acting as a valve to syringe ; 6, inflation syringe ; 7, support for transmission sphygmograph ; 8, pelette ; 9, screw for adjusting sphygmograph to artery ; 10, clip for arranging pressure ; 11, recording lever of manometer : 12, weighted thread for adjusting lever ; 13, tambour recording movements of transmission sphygmograph ; 14, arm marking abscissa ; 15, revolving cylinder ; 16, clock-work.

record of the arterial pressure, which is a great advance upon the older instruments as it records the exact pressure at any given time. He considers the *mean* reading at the time of greatest oscillation to be the diastolic pressure, for the inertia of the mercury is apt to carry the lowest point of oscillation below the true level, if the pressure is allowed to fall continuously.

REFERENCES. [1]*Clin. Journ.* Jan. 8, 1908; [2]*Med. Chron.* Feb. 1908; [3]*Edin. Med. Journ.* Jan. 1908; [4]*Journ. Amer. Med. Assoc.* July 6, 1907; [5]*Berl. klin. Woch.* May 25, 1908; [6]*Proc. Roy. Soc. Edin.* 1908, *Quart. Journ. Med.* Oct. 1907.

BOILS. (*See* CARBUNCLES AND BOILS.)

BONE CAVITIES, TREATMENT OF. *Priestley Leech, M.D., F.R.C.S.*

Many efforts have been made to shorten the period of convalescence after the evacuation of bone abscess, and Mikulicz's method of filling the cavity with a mixture of iodoform and paraffin has generally given the best results. Walton,[1] however, has used Paraffin with a melting point of 120° F. without any admixture. It sets more firmly than Moorhof's mixture, it can be sterilized more readily, and has no local or general toxic characters, and from skiagraphic examination Walton thinks the statement that it is not absorbable is incorrect. The method of procedure which he has adopted is as follows: The wound made in the soft parts is carefully protected against contamination with the material in the abscess cavity by gauze packing. This packing

FIG. 15.—SYRINGE FOR HOT AIR TREATMENT.

also protects the parts against the irritant substances used to sterilize and dry the cavity. The cavity is thoroughly scraped out and its fibrous wall removed; it is then swabbed out with pure carbolic, and then with a mixture of formalin 1 per cent, gelatin 1 per cent, and water 98 per cent, as advised by Moorhof; this diminishes the hæmorrhage considerably. Hot air is then pumped into the cavity until it is quite dry; the paraffin is poured into the cavity, the gauze packing is removed, the periosteum united over the cavity, and the skin united with silkworm-gut sutures. Two cases treated by this method, one probably an attenuated staphylococcic infection and the other tuberculous, healed by first intention. The illustration (*Fig.* 15) shows a syringe for pumping hot air into the cavity; the nozzle and tube are sterilized before use, the metal bulb is heated over a lamp, and the hot air pumped through.

REFERENCE.—[1]*Lancet*, Jan. 18, 1908.

BONES, RARE SURGICAL INJURIES OF.

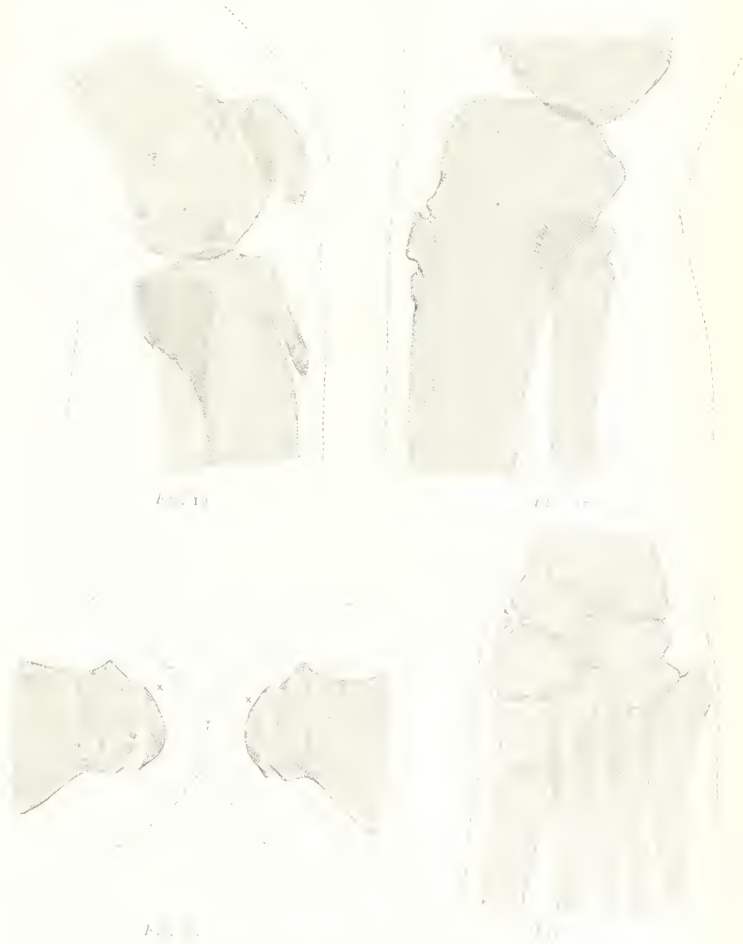
Priestley Leech, M.D., F.R.C.S.

Haglund,[1] of Stockholm, describes several injuries whose nature was obscure until the introduction of the X rays made their diagnosis easy. The most common is what is called "Schlatter's disease." It occurs in athletic children, more especially boys, who present a tender spot just where the ligamentum patellæ is attached to the tibial tuberosity. Every movement which puts a strain on the ligamentum patellæ gives rise to acute pain. This condition may last a long time, rendering the child more or less an invalid for several months. Strangely enough, it is seldom that the condition can be associated with a particular accident or strain. On examination of the head of the tibia in a boy of thirteen years, the condition as shown in *Fig.* 16 is found, where the ossification centre sends down a long projection in front of the upper end of the tibia. This trunk-like process reaches down to where the ligamentum patellæ is attached, and the "point of attachment" is completed by the merging together or union of the bone and the projection, which usually takes place at the eighteenth or nineteenth year. Before the twelfth year no trunk-like projection is to be found, but it is about this time that it begins to ossify. Any exertion of the extensors of the knee undoubtedly puts a certain amount of strain on the apex of this projection, and this is the cause of the lesion. The traumatic lesion itself may vary a good deal in its pathological aspect, but it is better to include them all under the name of "Schlatter's disease." One may find a bending outwards of the trunk-like projection, a partial separation of it from the diaphysis, or in still more severe cases, a complete separation with the fragments more or less dislocated. In most of the cases a fracture of the projection is found. *Fig.* 17 shows an excellent instance of this. Clinically all these varieties resemble one another. They occur always between the twelfth and nineteenth years; they happen to strong, energetic children, fond of games, and are more common in boys than girls, and in the right leg. Generally the trouble comes on gradually. The patient begins to complain that his knee hurts him, and he then discovers a bump there, and it gradually becomes more painful; at last even ordinary walking becomes painful, and he is taken to see a medical man. The lesion usually lasts six months, but two years may elapse before the patient gets a useful limb again.

Treatment.—An X-ray picture should be taken, and if the lesion is a severe one the patient should be put to bed with or without a splint. In milder cases it may be sufficient to warn the patient against exercises calculated to irritate the lesion; walking on the level ground is all right, but stair work should be forbidden. No massage and no medical exercises should be employed. It is difficult sometimes to make the parents believe the condition will end in cure.

Another lesion of the same nature happens to the epiphyseal centre of ossification of the calcaneum just at the attachment of the Achilles tendon. This centre begins to show itself about the tenth year, and

joins the more important ossifying centre about the eighteenth year. A separation or a fracture may occur here from some great strain involving the calf muscles (*Fig.* 18). It is more troublesome and slow to cure than Schlatter's disease, because it is more difficult to avoid strains to the part, for even a quiet walk affects it, and the patient must lead the life of an invalid for a year or more



A third injury occurs to the tip of the tubercle of the os calcis of the foot (*Fig.* 19). This bone is not completely ossified until about the sixteenth or eighteenth year. It sometimes happens that the ossifying centre becomes fractured without any injury to the perichondrium, and therefore without giving rise to any pain. The injury is caused by

severe strain to the instep involving violent stretching of the ligaments which spring from this point. Games, e.g., lawn tennis and football, and also strenuous dancing, may cause the lesion. One ought never to make light of these injuries, for it is only by insuring rest and avoidance of all and every strain to the injured part that one can save the patient from being more or less an invalid for months, even years.

REFERENCE.—[1]*Lancet*, July 4th, 1908.

BRAIN, SURGERY OF. *K. W. Monsarrat, F.R.C.S.*

Harvey Cushing[1] contributes a paper on "Technical Methods of Performing Certain Cranial Operations," illustrations of which accompany this article.

General Preparation.—The head is not prepared the day before the operation, but just before it is begun. The head is shaved, cleansed with green soap and a brush, and wrapped in a towel wrung out of warm bichloride solution. The final preparation is deferred until after the anæsthetic.

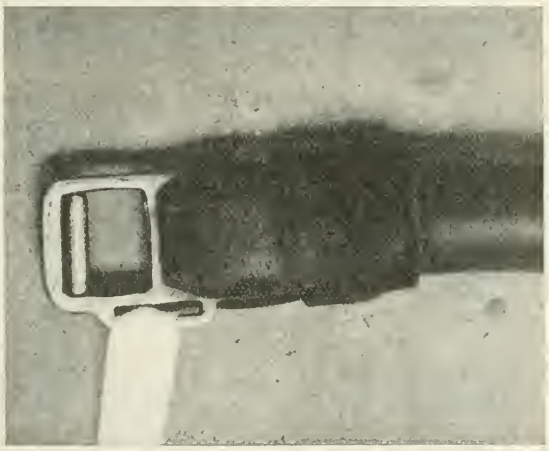


Fig. 20.—Rubber ring, with buckle, for Brain Surgery.

Position on the Table.—The patient should be placed on the table in the most favourable position for the operation, before administering the anæsthetic. In operations on the vault, a flat sand-pillow is all that is required. For occipital work a head extension with shoulder supports is essential (*Plate III*, *Figs. A* and *B*).

The Anæsthetic.—Regardless of the drug to be employed, it is essential that it be administered by an expert. In all serious or questionable cases the patient's pulse and blood-pressure should be followed throughout the entire procedure. A further safeguard is an artificial respiration apparatus, to be put into use in case there is a failure of an already burdened respiratory centre. Local anæsthesia may suffice at times.

In favourable cases no anæsthetic may be required in a second-stage operation limited to manipulations of dura and brain after re-reflecting an original bone flap.

Preparation of the Operative Field.—A square of wet bichloride gauze is thrown over the entire head and over this in turn are placed a tourniquet (*Plate IV, Fig. C*), and a rubber ring in which is inserted a buckle (*Fig. 20*); the latter is provided with a tape whose length should equal the distance from nasion to inion. This prevents the ring from rolling over the orbits. Around and above the tourniquet a small rolled towel is placed and tightly fastened, and to this is secured a sheet, which covers the anæsthetist like a tent (*Plate IV, Fig. D*).

Reflection of the Flap.—The bone is divided between two or more primary openings. A primary opening is made with a trephine (*Plate V, Fig. E*); secondary openings with a Doyen perforator and burr (*Plate V, Fig. F*); and the dura separated between these openings. The joining of these openings is commenced with Dahlgren or Montenovesi forceps (*Plate VI Fig. G*); and completed with a Gigli wire saw. The bone is cut by the latter with a broad bevel (*Plate VI, Fig. I*).

Intracranial Procedures.—The dura is opened in a line concentric with the bone incision (*Plate VI, Fig. H*), care being taken not to wound the pia arachnoid. If the expected lesion is not disclosed, the central fissure may have to be determined by faradization of the cortex, Sherrington's electrodes being used (*Fig. 21*). The current should be just strong enough to contract exposed muscle. A brain which tends to protrude may sometimes be dropped back by elevation of the head and trunk, or by evacuating cerebrospinal fluid; for this purpose a lumbar puncture may be necessary.

Closure.—The dura must be carefully sutured. The galea aponeurotica should be drawn together by a few buried sutures, and the edge of the flap accurately and solidly approximated (*Plate VII Figs. K, L*). Drainage is necessary in about 20 per cent of cases, and drains are inserted through the trephine opening, and brought through puncture wounds made in the scalp about 2 cm. to its outer side. The first dressing is made in forty-eight hours, when the drains (if used) and all the sutures are removed.

TECHNIQUE OF CRANIAL OPERATIONS.

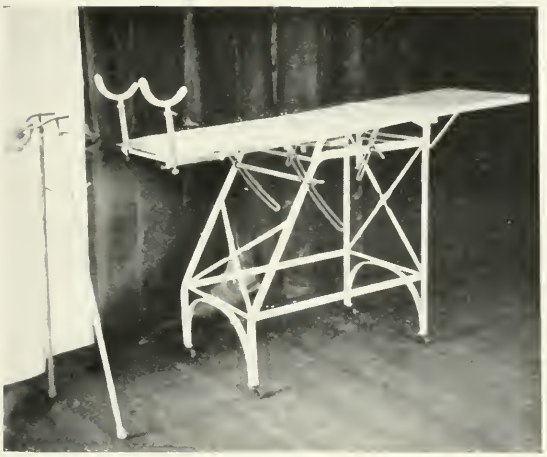


Fig. A

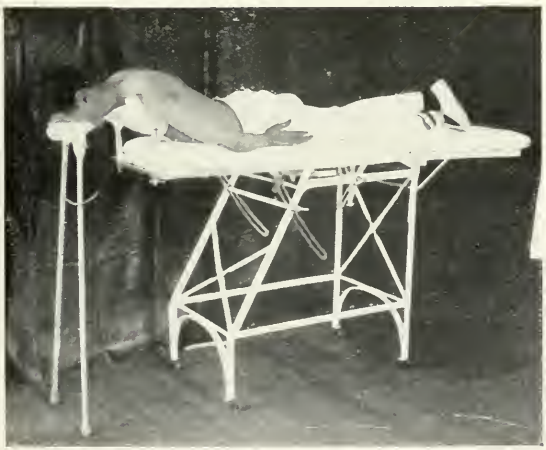


Fig B

TECHNIQUE OF CRANIAL OPERATIONS

Fig. C

Fig. D

PLATE V.

TECHNIQUE OF CRANIAL OPERATIONS.

Fig. E.

Fig. F.

TECHNIQUE OF CRANIAL OPERATIONS

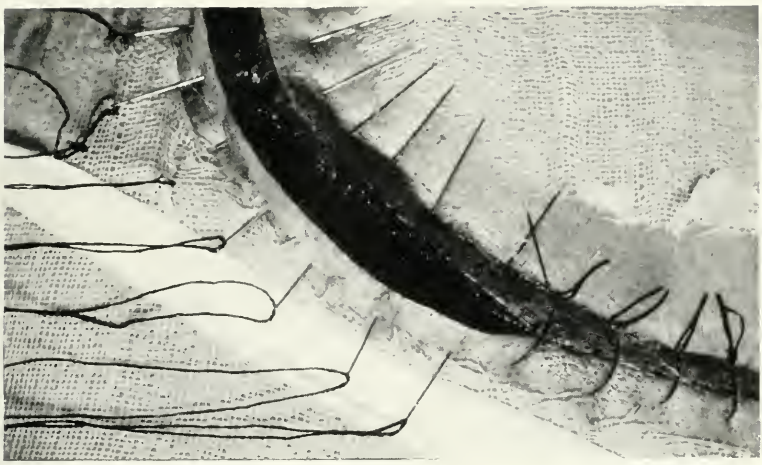


Fig. K.

Fig. L.

FIG. M.

FIG. N.

FIG. N1.

FIG. O.

Operations frequently require to be performed in the *temporal region ;* for example, for gaining access to the Gasserian ganglion ; for relieving symptoms in case of increased intracranial tension ; and in fracture of the skull with general pressure symptoms. In the ganglion operation (*Plate VIII, Fig. M*) the bone is laid bare down to the lower part of the temporal fossa by division above and scraping away from the bone below. The zygomatic arch should be removed. Experience, patience, and a proper kit of spatulæ and blunt dissectors are the essential requisites for success.

For Subtemporal Decompression Operation (*Plate VIII, Figs. N, N1*).—A flap of scalp alone is reflected, with careful preservation of the aponeurosis. When the latter is in turn incised, the temporal fascia is laid bare and incised in line with the muscle fibres. The edges of the split muscle are held apart and the bone perforated. The operation is, of course, done on the right side. The wound is closed in four layers—muscle, fascia, aponeurosis, and skin. Not only for tumours, but for other conditions of tension, a subtemporal decompression will often prove a helpful and sometimes a life-saving measure. Among these conditions may be mentioned thrombosis or embolism, intracranial syphilis, and many forms of œdema, more particularly in acute serous meningitis and in the œdema of nephritis. In bursting fractures without external indication of the character and situation of the cerebral lesion, no exploration is so likely to disclose the seat of the trouble as one in the temporal region. It is often desirable to carry out the operation bilaterally.

For suboccipital operations Cushing prefers the symmetrical face-down position, and has devised a support in which the head rests (*Plate III, Fig. B*). A bilateral exposure of the cerebellar lobes is desirable. In addition to the ordinary curved incision above, a median incision down to the occiput and the upper cervical spines facilitates access. The mid-occipital sinus if present is ligatured, and the dura is widely opened. Such an exposure gives access to the fourth ventricle and the structures in the cerebellopontine angle.

In another paper,[2] Cushing states that temporal decompression operations are proving satisfactory in two important ways. Allowing as they do the protrusion of a large amount of the silent area of the brain, they not only give relief from pain, but allow of the restitution of functions subverted from the normal by intracranial pressure. An important outcome of this measure has been that a certain number of cases are returning in which the time gained had permitted a tumour, unlocalizable at first, to develop sufficiently to give rise to definite focal symptoms. The diagnosis has been impossible at the time of the decompression operation : a second operation for the removal of the tumour is now possible. He remarks on the danger of lumbar puncture in cases of tumour below the tentorium.

A. C. Wood[3] describes a modification of the Stellwagon instrument for osteoplastic resection of the skull. He states that flaps can be reflected with great rapidity ; in a number of instances the longest

period required was eight minutes; the shortest was one minute and fifty seconds.

Borchardt[1] reviews the subject of operations for *Cerebellar Tumours* in the light of present statistics. Very extensive exposure of the base of the brain can be made safely. If necessary, the lateral and occipital sinuses may be ligatured, but the longitudinal sinus and the tentorium must be spared; if the tentorium is injured, prolapse is almost certain to follow. Prolapse after operation is not always a sign of infection; but is almost always fatal. In 101 cases of tumour reported the tumour was found in fifty-one, and of these twelve were cured. No tumour was found in sixty, but five of these were relieved of all their symptoms by the operation, and twelve showed temporary improvement. Of fourteen cases of cyst, thirteen were cured. Other conditions in which operation in the cerebellar fossa has proved valuable are tubercular foci and neuromata of the cranial nerve roots. Decompression operations have been performed here for large irremovable tumours, and some cases of chronic meningitis. In the last case the indications are not precise; but the results have generally been good.

V. Eiselberg[5] reports the route followed in a case of *Tumour of the Pituitary Body*. After separating the nose and turning it over to the right, the septum was separated and the superior turbinate removed. The frontal sinus was then displayed and the anterior wall removed. The vomer was removed piecemeal to its base, and the periosteum separated from the anterior wall of the sphenoidal sinus. This wall was then removed and the sinus thus opened. Within the latter was a whitish protrusion, which on incision yielded several spoonfuls of a fluid which had the appearance of old blood. The wall of this cyst was removed, the wound tamponned, and the nose replaced. The result of the operation was good.

Relief of Compression in Fractures with Intracranial Complications.—Operation for the relief of compression following cranial injury may be considered of established value. Hartwell,[6] in a paper entitled, "The Question of Operation for Non-penetrating Intracranial Trauma," relates two instances of what he calls border-line cases, in which signs by which the exact injury could be localized were absent, and in which a "decompression" operation in the temporal region relieved the symptoms of compression. The one case was that of a boy, aged 10, who received a diffuse injury to the head, producing immediate concussion, followed later by signs of compression. At the operation, blood-tinged cerebrospinal fluid was evacuated under increased pressure, and commencing œdema of the brain was found. Recovery followed. The other case was that of a woman who also received an injury to the head, this being followed by signs of compression after three hours. There was no improvement for three days; a decompression operation was performed; no localized lesion was found. The patient promptly improved, and ultimately recovered. These two cases are excellent examples of the value of the simple decompression operation in head injuries where there are no localizing signs.

Harvey Cushing[7] returns to this subject in a paper on *Subtemporal Decompressive Operations* for the intracranial complications associated with bursting fractures of the skull. He says, "Contrary to our former high mortality in cases of basal fracture—about fifty per cent—we have only lost two out of our last fifteen cases, both of these due to the fact that a unilateral exploration alone was performed, and an extensive extravasation on the opposite side of the head was overlooked." He employs an obliquely vertical incision through the scalp, and separates the fibres of the temporal muscle in the manner already described (*Plate VIII, Fig. O*).

The subject of the indications for operation in cases of *Intracranial Tumour* was discussed at the British Medical Association Meeting in 1907.[8] Dr. Risien Russell referred to the diagnosis between tumour, hysteria, general paralysis, disseminate sclerosis, and cerebral thrombosis. He then discussed the conditions under which operation might be recommended. Under certain circumstances operation could be recommended in the hope of effecting a cure; the question was influenced by the possibility of accurate localization, the accessibility of the growth, and the nature of the growth. In connection with syphilitic tumours, he insisted that a considerable proportion required to be dealt with surgically, and that it was a mistake to waste valuable time in pushing antisyphilitic treatment when the symptoms were not yielding to mercury and iodide of potassium. Under other conditions operation was to be recommended, simply for the relief of symptoms and the prolongation of life. Great relief of symptoms followed removal of bone and free opening of the dura. So much relief was obtained in this way, that the operation should be recommended with a view to relieve those symptoms if drugs no longer influenced them, even if the indications did not justify the belief that life was in immediate danger from the effects of abnormal intracranial pressure. He was so strongly impressed with the value of trephining for the relief of optic neuritis, and with the object of saving sight, that he had no hesitation in saying that no patient suffering from intracranial tumour ought to be allowed to become blind, when in this operative measure there was an effective means of preventing so lamentable an occurrence, provided the operation was undertaken early enough, before the neuritis had subsided into consecutive atrophy of the optic nerves. In lumbar puncture there was a means of relieving urgent symptoms of pressure; but the relief was not to be compared with that given by trephining.

Sir William Macewen[9] held that an operation should be sometimes performed for brain tumour even in the absence of its classical symptoms. He was quite in agreement with Dr. Risien Russell that in certain cases of syphilitic tumour of the brain operation was urgently indicated, but especially if the gumma were large or caseated. The duration of an adequate trial of medicines in cases of brain tumour was a matter which was ordinarily left to the physician, but it should not in his opinion be long: not many months at any rate. With regard

to the alternative plan of doing the operation of removal of an intracranial tumour in one or two stages, he considered it a good method to wait until the first stage was completed before deciding whether the further operation should be postponed or at once proceeded with, the decision depending on the condition of the patient with reference to shock, at the time. Operation was certainly to be recommended in suitable cases for the relief of symptoms alone. Moreover, he had often seen the paralysis following on an operation completely pass away. In those cases, however, where aphasia or sphincter paralysis seemed inevitable, he would be reluctant to advise operation. With regard to lumbar puncture for the relief of intracranial pressure in brain tumour, he thought sufficient data were not forthcoming to establish its efficacy or otherwise.

Eugen v. Hippel[10] has examined the literature of the subject of palliative trephining for *Optic Neuritis*. He found 221 cases in which the results were stated. Of these, 53 died either immediately or soon after the operation. In the 168 remaining, the optic neuritis improved in 150, and did not improve in 18; in the records of the remainder no definite statement was made. Only in 24 cases was the sight serviceable before the operation; of these 2 died from the operation, in 1 the sight became worse (a case of direct compression of the optic tracts), in 21 sight was retained or improved, but in 6 the improvement was only transitory. In 62 cases there was no useful vision before operation; in 61 the loss of vision was arrested or improved; and in 11 of these the improvement was substantial. The records show that the prognosis of operation is good if done at a relatively early stage, but bad if it is delayed until vision is practically lost.

In reporting a case of *Brain Cyst* successfully localized and removed from the left parietal lobe, C. H. Frazier[11] states that in his experience from 15 to 20 per cent of brain tumours were operable. He believed that if we explored in a more routine manner we should find the tumour more often than we do, and earlier. Amongst records of successful removal of brain tumours the papers by W. W. Graves,[12] McKennan and Proescher,[13] and Adler,[14] deserve special notice. Graves' case was one of cyst overlying the precentral, post central, and the first and second frontal convolutions. The case of McKennan and Proescher was one of "neuroglioma ganglioccllulare" in the second frontal convolution; Adler's case was one of perithelioma, subcortical in position, and shelled out from the white matter underlying the precentral gyrus in the region of the arm centre. In shelling it out the finger penetrated to a depth of 8 cm. below the surface. All these three cases were successful.

Puncture of the Brain.—Tillmanns[15] considers that puncture of the brain will shortly be more frequently practised for purposes of diagnosis and treatment. In diagnosis it is of value in locating cysts, tumours, foreign bodies, accumulations of blood and other fluids, when the site of the lesion is not determined by the symptoms. As a method of treatment it has been employed in hydrocephalus, hæmorrhage, etc.

The opening in the skull is made by a drill after preparation of the scalp in the usual way, and the further exploration is made with a hollow needle. If it is desired to reach the ventricle, this is best done from above through the frontal bone, about 2 cm. from the middle line and 3 cm. from the precentral fissure. The needle is passed downwards and backwards.

Neisser[16] has paid much attention to this matter, and has described a series of cases. The results obtained proved of much value in the diagnosis of intra- and extramedullary hæmatomata, brain cysts, extradural abscesses, tumours, and collections of fluid in the ventricles. He quotes a series of observations by Pfeiffer. In 30 cases in which the latter used puncture for the localizing of brain tumour, he obtained favourable results. In 5, after localization, operation cured ; in 18 cases out of 19 the local diagnosis was correctly made ; in 8 other cases the diagnosis was confirmed. He also quotes cases of cerebellar cyst cured by puncture, a case of abscess localized by the same method, and several cases of ventricular distention favourably influenced.

Ascoli[17] also pleads for a bolder and more frequent use of exploratory puncture. He recounts 230 such punctures in seventy cases. He considers that its value has been established in cases of abscess, cyst, hæmorrhage, and tumour. As in empyema, he considers it well not to be satisfied with a single puncture, and he refers to cases where repeated puncture finally revealed an operable lesion. The chief dangers are hæmorrhage and infection. The former is to be avoided by study of the distribution of the vessels ; the latter by dealing at once with an infective focus if tapped.

Krause[18] has written an article on these risks which is worthy of consideration. He says the branches of the middle meningeal artery, the cerebral arteries, and the venous sinuses are avoided without difficulty, as their course and position are known. The pial veins, however, are much dilated when the intracranial pressure is increased, and are easily wounded ; and in cases of cerebral tumour the normal course of vessels may be much altered. He relates cases of troublesome hæmorrhage after free opening of the skull from arteries accidentally wounded with the needle, and asks what would have happened if these injuries had been inflicted in the course of a simple puncture of the brain through a puncture opening. The second danger is infection. If a collection of pus under pressure is tapped by a needle, it is difficult to see how a leaking into the subarachnoid space along the needle track is to be prevented if the skull is not freely opened. He explains that he does not mean to write against puncture of the brain in general, but only against its indiscriminate and careless use. He welcomes it as a valuable addition to methods of diagnosis in combination with others. It should only be undertaken if complete preparations have been made for immediate trephining.

Intracranial Hæmorrhage in the New-born.—Ludwig Seitz[19] writes an important article on the localization and the symptoms of this

condition, based on the observation of twenty-three cases. He first refers to the fatal cases. The hæmorrhage, almost without exception, is venous and subdural, hardly ever in the brain substance and rarely in the ventricles. It is of great clinical significance whether the bleeding is supra- or infratentorial. In his series all infratentorial hæmorrhages were fatal: pressure on the medulla and the respiratory centre is the cause of death; lumbar puncture shows blood-stained fluid. The child is usually born without symptoms of asphyxia, or only slight signs; it cries normally, and may take the breast. It is quiet in contrast to the child with a supratentorial hæmorrhage. After the lapse of some hours the respiration becomes irregular and cyanosis appears. There is no distention of the fontanelles. Death follows from respiratory embarrassment in twenty four to forty-eight hours after birth. There may be signs of spinal irritation from hæmorrhage into the spinal canal. The supratentorial hæmorrhages are not so fatal. They are almost always unilateral and confined to the convexity of one hemisphere. Traces of blood only are found in the cerebrospinal fluid on lumbar puncture. The children are often born naturally and easily, and show no signs of asphyxia. On the first day there are no remarkable symptoms. On the second there is great restlessness: they cry incessantly, and refuse nourishment. The apparently causeless loud crying is a very characteristic symptom. The anterior fontanelle is distended. The later symptoms are those of increasing cerebral pressure. The local symptoms are very important. They are most marked in the face, which may show spasm, or paresis; spasm of the leg and arm on the opposite side also occurs. In the earlier stages these localizing signs are unilateral. Respiratory paralysis causes death on the fourth to the eighth day. If the symptoms show improvement on the third day, recovery is probable; if they are stationary, or progress on that day, the prognosis is unfavourable. All cases which show definite signs of progressive cerebral compression ought to be operated on. Seitz relates one case of operation: the hæmorrhage was, however, both supra- and infratentorial, and the child died. Five of the cases recovered: all were cases of supratentorial hæmorrhage. So long as there are only circumscribed cerebral focal symptoms, incision is contra-indicated; but general progressive signs of compression call for operation. In infratentorial hæmorrhage, however, operation is not likely to be of any use. It should be noted that in six of the cases—that is to say more than a quarter—the labour was spontaneous and easy. In one the mother was a 15-para.

REFERENCES.—[1]*Surg. Gyn. and Obst.* Mar. 1908; [2]*Med. Rec.* June 13, 1908; [3]*Deut. Chir.* May, 1908; [4]*Arch. f. klin. Chir.* Bd. [illegible]; [5]*Münch. med. Woch.* Oct. 22, 1908; [6]*Ther. Mon.* July, 1908; [7]*Ibid.* May, 1908; [8]*Brit. Med. Journ.* Oct. 20, 1907; [9]*Ibid.*; [10]*Münch. med. Woch.* Sept. 15, 1908; [11]*Med. Rec.* Sept. 5, 1908; [12]*Ibid.* May 23, 1908; [13]*N. Y. Med. Journ.* July 18, 1908; [14]*Berl. klin. Woch.* May 11, 1908; [15]*Brit. Med. Journ.* Oct. 3, 1908; [16]*Berl. klin. Woch.* Oct. 14, 1907; [17]*Rev. Med.* Dec. 14, 1907; [18]*Berl. klin. Woch.* June 20, 1908; [19]*Münch. med. Woch.* Mar. 24, 1908.

BREAST, CANCER OF. *Priestley Leech, M.D., F.R.C.S.*

There was a discussion on this subject at the meeting of the British Medical Association, introduced by Sir W. Watson Cheyne. He laid stress on gentleness in all manipulations of the breast, for it must be borne in mind that one may very readily press the cancer cells along the lymphatic vessels, or what is more serious, along the blood-vessels, and it is just in the doubtful cases that one is inclined to employ a considerable amount of manipulation, not always gentle, to determine the character of the lump. In advanced cases it is often quite easy to make a diagnosis without even handling the tumour at all. The chief points which should be examined are the following :—

1. *Inspection of both Breasts.*—An early and most important sign is a difference of level of the nipples, that on the diseased side being at a higher level than on the healthy side ; it is due to shrinking of the tumour, especially if it has become adherent to the pectoral fascia, and it becomes very marked as the tumour increases in size. A similar condition may be found in acutely inflamed or tuberculous breasts.

2. *Puckers and Dimples.*—This condition is not apparent on simple inspection until the disease has become far advanced, and no other diagnosis can be made except that of carcinoma.

3. *Mobility of the Skin* can usually be obtained by quite gentle manipulation. By pushing the breast gently with the fingers in various directions one can see whether the breast moves freely under the skin, or whether the skin is drawn on by the tumour. If the skin is gathered up over the tumour, it either wrinkles in a regular manner like the normal skin, or there is an irregularity in the wrinkling.

4. *Adhesion of the Tumour* to the pectoral fascia is a matter of great importance. Its existence can be ascertained by putting the muscle on the stretch and seeing whether the tumour moves as freely as the corresponding part of the other breast in the direction of the muscular fibres. Any deficiency in movement in the case of a tumour where there are no acute or subacute inflammatory symptoms practically indicates carcinoma.

5. *The Character of the Lump itself.*—Here one must be especially gentle in the manipulations. In many cases the important point is the indefinite character of the swelling. If the cancer is quite small, one may simply feel what appears to be a hunched-up piece of fairly normal breast, and it may not be easy to detect a tumour at all. In this case the suspicion of malignant disease is very strong, and if there is the slightest sign of puckering or adhesion to the fascia, or elevation of the nipple, the diagnosis is practically certain. It is not always easy to differentiate between a patch of mastitis, a cyst of the breast, and a malignant tumour. The diagnosis of a cyst can be made by introduction of a hypodermic needle.

6. *The Age of the Patient.*—Always be suspicious of a lump in the breast in a patient over forty years of age ; mastitis is common above this age, but if the breast does not show signs of improvement after

a few weeks' treatment, it is better to make the diagnosis certain by operating than go on watching it until too late, a pathologist being present to make a microscopical examination and leave being obtained to do what is necessary.

7. *Diagnosis by Operation.* In any exploratory operation it is extremely important not to cut into the tumour itself, for if it turns out to be malignant an incision into the mass is very likely to distribute the cancer cells far and wide over the wound. Excise the suspicious mass widely, and examine it after its removal from the body. If it turns out to be malignant, proceed with the complete operation at once.

Operative Treatment. There can be no discussion as to the value of extensive operation in cancer of the breast: the chief points for discussion are really matters of technique. Three principles have to be attended to: (1) Remove the breast thoroughly: (2) Avoid dissemination of the cancer cells while so doing: (3) Obtain a good functional result afterwards. The amount of skin removed varies according to situation of tumour and the amount of skin involved. If the skin is adherent, remove widely, and if the tumour actually involves the skin, this latter must be removed very freely indeed. Remove fascia more widely than the skin: remove fascia over serratus magnus and abdominal muscles. Remove sternal portion of pectoralis major, and, if glands are involved, the minor also. Remove glands and lymphatics in one piece, and also costo-coracoid membrane, and detach from apex of axilla downwards. If there is considerable involvement of the axillary glands clear out the posterior triangle of the neck as well. To avoid infection, take care not to cut into cancerous tissues: in handling the tumour take care not to squeeze it, begin the dissection of the axilla at the apex and remove the sheet of fat and glands from above downwards. Stiles believes that though a preliminary diagnostic operation may be called for in certain cases it is the duty of the surgeon to do his best to avoid it. The only justifiable attitude for the surgeon to take is that the axilla must be regarded as infected in every case of carcinoma of the breast, however recent, and both pectorals should be removed except the clavicular fibres of the pectoralis major.

With regard to ulcerated cancers of the breast two groups may be recognized: (1) Cases in which the disease is so far advanced that a permanent cure is out of the question. Here an incomplete operation is often indicated simply with the object of relieving the patient of an unhealthy and painful ulcer. (2) Ulcerated or infiltrating tumours where there is a chance of permanent cure by the radical operation. Here the difficulty is to prevent septic infection. If the ulcer is small, it may be disinfected with the actual cautery or pure carbolic acid. If the ulcerated area be larger, Stiles has divided the operation into two stages: at the first, only the diseased skin and breast are removed, care being taken not to open up the axilla. The wound may be partially sutured, but no attempt is made to close it entirely.

Ten days or a fortnight later, when the wound is covered with healthy granulations, the operation is completed by removing the pectorals and completely clearing the axilla.

In the discussion which followed, some of the speakers laid stress on the earlier diagnosis of cancer, as if certain signs are waited for even an extended operation may be too late. **X-ray** treatment was recommended as a routine after operation, and also for local recurrences. Some only removed the greater pectoral, and unless the glands were markedly involved, left the pectoralis minor. The conclusion from the whole discussion is that the present extensive operation for cancer of the breast, if conducted on lines dictated by the pathological findings described by Sampson Handley, is amply sufficient to lead to what may be designated a cure in at least 40 to 50 per cent of cases, provided the case is seen early enough and the cancer is not of a very acute and malignant type. In order to get the cases early enough, both the public and the profession need educating, so that both may recognize how insidious the commencement of mammary carcinoma is. It is much better for a woman to undergo even the modern extensive operation than leave a suspicious lump until cure by operation is impossible.

REFERENCE.—[1]*Brit. Med. Jour.* Oct. 3, 1908.

BREATH, FOUL. (*See* FOUL BREATH.)

BRIGHT'S DISEASE. (*See* ALBUMINURIA and NEPHRITIS.)

BRONCHIECTASIS.

(*Vol.* 1907, p. 152)—Improve the general health by tonics, suitable climate, breathing exercises, and massage. Empty the cavities by inversion of the patient, compression of the chest, or liquefying expectorants for several days, followed by emetics. Relieve fœtor by vaporized antiseptics (the best form is the **Creosote Vapour Bath**). For all except children or nervous patients 1 to 4 dr. of the following intratracheal injection may be given at regular intervals: Menthol 10, Guaiacol 2, Olive Oil 88 parts. **Garlic** ℳss, in capsules thrice daily, is recommended. Treat complications as they arise.

BRONCHIECTASIS IN CHILDHOOD (Treatment by Posture).

Joseph J. Perkins, M.A., M.B., F.R.C.P.

This method is employed as an adjunct to the use of intratracheal injections or the inhalation of creosote in a special chamber (A. Chaplin). The latter method is applicable even in young children, while the former is difficult. Quincke was the first to suggest treatment of these cases by posture, the child being placed in the inclined prone position for an hour once or twice in the twenty-four hours—the *intermittent* method—the idea being to empty the bronchi. W. Ewart[1] has advocated the *continuous* method by keeping the patient in bed, and by raising the foot of the bed considerably, so as to maintain a marked downward slant from the bronchi to the larynx. He was led to this idea by the excellent results of emptying the cavities by *inversion*, the patient leaning over the side of the bed and lowering the head and upper part of the trunk, or in the case of a young child being held actually upside down. The foot of the bed having been raised, or the mattress itself

by some special form of support, to keep the child in the required position, he must be placed between two sand-bags, otherwise he tends to slip into a horizontal position. The bolster must be small and firm, so as to support the head only and must be secured to the end of the bed.

Besides emptying the bronchi and keeping them empty, Ewart aims at promoting the expansion of the lung. This he seeks by means of a costo-abdominal elastic belt, whose pressure stimulates the movement of the diaphragm; and when the child is up by day, by means of an exercising machine on which he lies face downward, and which he can propel. The bulk of the lung which is posterior is set free in this way, and the downward slant towards the head is still maintained.

REFERENCE.—[1] *Med. Press*, May 20, 1903.

BRONCHITIS.

Joseph J. Perkins, M.A., M.B., F.R.C.P.

ETIOLOGY AND TREATMENT.—Buckler (1882), according to Haig,[1] was the first to point out the influence of the uric acid diathesis in the causation of certain forms of bronchial catarrh which on that account resisted all treatment except the salicylates, the indication for their use being a marked acidity of the urine. In the frequent cases in which acidity is low, they fail, and Haig was led to substitute the alkalies. It is only necessary, he finds, to give an **Alkali** in sufficient dose to render the urine alkaline, to cause an almost immediate fall of temperature and relief of dyspnœa. He prefers sodium bicarbonate, and finds 20 to 60 gr. sufficient for a child and 60 to 120 for an adult, in the twenty-four hours. He discards ammonium salts because they tend to raise the acidity of the urine.

Sir James Barr[2] is also inclined to find the cause of a large percentage of cases of bronchitis in the excretion by the bronchial mucosa of toxins or irritating substances absorbed from the digestive tract. If *alcohol* be included among the toxic substances absorbed from the stomach, then 50 to 70 per cent of cases of chronic bronchitis may be associated with the digestive tract. It follows from this that the best way to cut short and prevent attacks of bronchitis is by attention to the alimentary canal. He advocates a pure dry atmosphere, warm during the acute stage; alcohol is utterly taboo.

Diet.—As a rule carbohydrates and fats should be cut down, but a liberal allowance of nitrogenous food may be permitted. Hot water is allowed. Corpulent individuals should be strictly dieted and their weight reduced. In all cases the bowels should be made to act freely.

Drugs.—Ammonium carbonate Barr says which seems to be the basis of every expectorant mixture is certainly injurious in the acute stages. He prefers **Antimony**; **Ipecacuanha** with **Tinct. Camph. Co.**; the **Citrates of Soda and Potash** when the sputa are tough; in bronchial spasm the **Nitrites, Potassium and Sodium Iodide. Apomorphine** and **Strychnine** in the form of the hydrochlorates make an excellent expectorant; for the very chronic cases **Terebene. Counter-irritation** is often extremely valuable and Barr confesses his preference for the mustard poultice.

Auld[3] also attaches great importance to diet and alcohol. Among drugs he favours **Potassium Iodide** and **Balsam of Peru,** the first in the dry stage, the latter when exudation is excessive, though it acts well also in some cases with scanty expectoration. It is given in doses of 10 to 20 min. disguised in emulsion with mist. amygdalæ or ammoniaci, oil of anise, and syrup.

Fœtid Bronchitis.[4]—Fœtor of the expectoration is not necessarily associated with gangrene, or indeed any gross anatomical lesion (except apparently some bronchial dilatation), but may occur as a form of bronchitis. At the post-mortem, if the bronchi be washed all the fœtor disappears. It is characteristic of fœtor thus produced that it is intermittent and ephemeral, and does not seriously affect the general health. It may occur in the course of an attack of ordinary or post-influenzal bronchitis, but is more commonly met with in chronic cases, especially in the alcoholic or debilitated. The fœtor is possibly due to the presence of anaerobic organisms. At the outset the symptoms are only those of the original bronchitis, but soon the sputa, copious and purulent, become fœtid, though the fœtor is never so extreme as in gangrene. The fœtor varies in intensity, becomes less, or disappears, soon however to return, the bronchitis persisting; and the attack may be prolonged for months, with alternations in the degree of offensiveness. Fever is not marked; hæmoptysis is uncommon, but may occur in large amount. Recovery may take place, or death ensue either from exhaustion or the supervention of gangrene with complications.

Fœtor of the breath and sputa need not indicate lung disease, but may result from disease of the upper respiratory tract—nasal, pharyngeal, or laryngeal. In the lung, besides gangrene, fœtid bronchitis, and bronchiectasis, the rupture of an empyema into the lung may be a cause. In a case, then, of fœtid expectoration, the upper air-passages must be carefully searched, and these being found healthy, the chest examined for signs of pulmonary disease or effusion. Signs being absent of these conditions, fœtid bronchitis may be considered. Whereas in gangrene the sputa often contain elastic tissue from the destruction of the lung, in fœtid bronchitis elastic tissue will be wanting.

Collapse of the Lung producing extreme displacement of the heart and mediastinum (towards the affected side) in the course of plastic bronchitis, is recorded by S. West.[5] As regards the plastic bronchitis, except that the casts were large and the temperature high (103°) with each formation, there was nothing of special moment. The interest lay in the collapse of lung produced by the casts—recurring with their formation and disappearing with their expectoration—and its physical signs. The percussion note all over the left lung was greatly impaired, becoming almost dull at the base behind: vocal resonance and breath sounds were absent. In fact, the signs were those of effusion except that the heart was displaced towards the left, the apex beat being an inch to the left of the left nipple line. The right lung was expanded, and its resonance reached across the sternum and an inch beyond. With the expectoration of the cast the cardiac impulse returned to its

normal position and the lung became more resonant, but still remained dull at the base. With the formation of a fresh cast, the collapse and dullness of the lung and the displacement of the heart returned. West has noticed a similar displacement of the heart from collapse of the lung once before in broncho-pneumonia.

REFERENCES. [1]*Brit. Med. Jour.* May 9, 1908; [2]*Ibid.* Ap. 18, 1908; [3]*Ibid.* Feb. 10, 1908; [4]H. Rabe, *Med. Press*, Mar. 11, 1908; [5]*Lancet*, Feb. 15, 1908.

BUBO, CLIMATIC. *J. W. W. Stephens, M.D.*

W. W. Stoney[1] publishes three cases of climatic bubo in Europeans of ages twenty-one, nineteen, and sixteen years respectively. The history is somewhat as follows in these cases. The patient being ill and weak the glands, generally of the inguinal region, begin to enlarge, usually on one side only. There is general malaise, irregular temperature, headache, and lassitude, so that in a week or so the patient takes to bed. There is no history of venereal disease. Early **Excision** is the best treatment. On cutting into the glands numerous pus foci are found. The cause of the disease is unknown, but there is not infrequently a history of sexual intercourse, though not of venereal disease.

REFERENCE.—[1]S. *Afr. Med. Rec.* Mar. 10, 1908.

BULBAR PARALYSIS, Ionic Medication in. *Purves Stewart, M.D.*

This malady is most intractable. Hitherto the best means of arresting its progress has been by strychnine hypodermically, commencing with small amounts and gradually increasing to massive doses. Any additional method, therefore, which offers a prospect of benefit, is worthy of trial. Fletcher Little and Bokenham[1] record the case of a man, aged 34, with advanced bulbar palsy.

The tongue lay helpless and atrophied in the floor of the mouth, the lips were flaccid, with dribbling of saliva, and the palate hung motionless. The patient was totally unable to articulate, and there was considerable difficulty in deglutition. There was the usual concomitant wasting of the small muscles of the hands. The deep reflexes of the limbs were exaggerated. Sensation, as usual, was unaffected. Ionic treatment by means of intermittent currents at high tension was initiated as follows:—

(*a*). Ionic introduction of sodium, lithium, iodide, or salicylic radical, either by means of large medicated pads applied over the occiput and cervical spine (the indifferent electrode being placed over the lumbar region), or by means of Schnee local bath cells, with the hands and feet immersed in the solutions. The results of the foregoing were practically nil.

(*b*). Application, on alternate days, of medicated electrodes as before, with the patient placed on an insulating platform, the pad being connected with the positive pole of a static machine of which the negative pole was grounded. The dischargers were then arranged so as to give a powerful "Morton wave" current. In addition, local application of similar current was made by means of a glass vacuum electrode over the affected muscles and their motor points.

After fourteen applications it was noted that the facial expression had improved, the original blank expression having passed off; the lips were fuller; the soft palate had regained some power of movement; the tongue seemed less shrunken, and could now be slightly protruded beyond the teeth. The patient's weight had also gone up several pounds. Treatment was then interrupted for a fortnight, when it was found that the patient had relapsed. On resuming the treatment, it was noted three weeks later that the palate and tongue had again improved. It was then found necessary to discontinue

the iodine ion, as its use increased the salivation and caused a metallic taste in the mouth. Unfortunately, the patient died suddenly two and a half months after commencement of the treatment.

It will be observed that the foregoing case was in an advanced stage, and it is therefore conceivable that still more striking effects might have been produced had the patient come under observation earlier in the disease.

REFERENCE.—[1]*Brit. Med. Jour.* Sept. 12, 1908.

BULLOUS ERUPTIONS IN CHILDREN.

E. Graham Little, M.D., F.R.C.P.

Bunch questions the advisability of separation of pemphigus neonatorum from impetigo contagiosa, and gives good arguments for their identification. Certain drugs (e.g., iodides, bromides, antipyrin arsenic, chloral, and quinine) may also produce bullæ, as well as external irritants such as cantharides, mustard, etc. Bullous syphilides occur in quite young children, and are distinguishable by the concurrent cachexia and the distribution of the eruptions on the palms and soles. Bullous urticaria is rare, as are also bullous erythema multiforme and pompholyx, and occurs in older children than the syphilide. An attempt is made to differentiate pemphigus from dermatitis herpetiformis, a distinction which is impossible when no other lesions but the bullæ are present; herpetiform grouping, when it occurs, is the best criterion of dermatitis herpetiformis, but the position in classification of these two types of disease remains very uncertain.

BUNION, SURGICAL TREATMENT OF. *Priestley Leech, M.D., F.R.C.S.*

Charles H. Mayo[1] has practised the following method of operation in bunion with marked success: A curved incision with its base downwards is made over the inner side of the metatarsophalangeal joint;

Fig. 22.—Hallux valgus deformity as shown by photograph.

Fig. 23.—Deformity as shown by radiograph.

the flap, which is of skin only, is raised, the bursa being left. A curved horse-shoe-shaped incision is now made round the bursa with its base attached to the base of the first phalanx: this flap is raised,

its inner surface being synovial membrane, and continuous with the anterior surface of the joint. The head of the metatarsal bone is then removed with heavy forceps, the section also removing two-thirds of the anterior portion of the bony hypertrophy of the inner side. The remainder of this projecting bone is cut away to the level of the shaft of the metatarsal. The cut end of the metatarsal bone is now rendered as smooth as possible by *rongeur* forceps, and the bursal flap is turned in to the joint area in front of the bone, where it is held in place by one or two catgut sutures. We thus utilize an already formed bursa to secure and maintain a movable joint which

Fig. 4.—Ra[illegible] [illegible]

Fig. 5.—Showing [illegible]

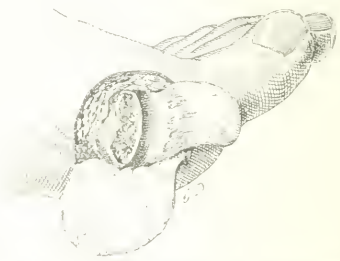


Fig. [illegible]—[illegible]

works in a movable splint—the shoe—and thereby secure an immediate result which is obtained with difficulty in other joints by transplanting fatty tissue into the joint area to prevent bony union. In some cases the tendon and sheath of the extensor proprius pollicis is best displaced by suture to the inner side of the midline of the toe. *Figs. 22-25* admirably illustrate the operation. After suturing the skin-flap in place, drainage is provided by a puncture in the base of the flap, in which is inserted a doubled catgut strand. The dressing is a pad of gauze wet with 70 per cent alcohol between the great and second toes. The anterior portion of the foot is covered with a dressing which is moistened at intervals with the same solution during the first few days.

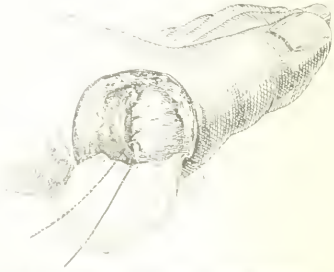


Fig. [illegible]—[illegible] joint.

REFERENCE.—[1] *Ann. Surg.* Aug. 1908.

BURNS AND SCALDS IN CHILDREN.

E. Graham Little, M.D., F.R.C.P.

Leale[1] summarizes the chief points of treatment as follows: **Aseptic Precautions** must be rigorously followed in the preparation of the hands of the operator, the dressings, and the surface to be treated; the wound must be cleaned, all vesications drained and irrigated with hydrogen peroxide in aqueous solution from 1–6 to 1–10 in strength, and afterwards with normal saline, or 3 per cent boric acid solution. The injured area is then dressed with a freshly prepared **Ointment of Zinc Oxide** in sterilized olive oil, made to any consistence that may be desired. Boric acid (3 per cent) may be added. This ointment is spread smoothly on thin gauze, and must be changed frequently, antiseptic irrigation being practised at each dressing. In burns of deeper type, which involve the papillary layer, it is better to apply directly to the surface strips of rubber or silver foil, and over these the sterile gauze. Exuberant granulations must be kept in check with nitrate of silver applications. **Constitutional Treatment** is highly important, especially in young children. The sick-room must be well ventilated and well warmed. Pain, if severe, must be controlled by opium: in children the tinct. camph. co. is a convenient mixture in doses of 1 to 15 min. at short intervals. The extremities must be kept warm. **Irrigation of the Colon** with hot decinormal saline kept in continuous flow by a double-channelled rectal tube or catheter is of great service when shock is pronounced. Stimulants when required should be given hypodermically. The amount of food taken must be restricted during the first few hours or days: when vomiting is troublesome, small doses of atropine combined with opium act best. In later stages, the diet must be liberal. The patient may be made more comfortable with a water bed.

REFERENCE.—[1]*Med. Rec.* May 9, 1908.

BURSITIS, SUPPURATIVE PNEUMOCOCCAL.

Priestley Leech, M.D., F.R.C.S.

Nabarro[1] records three cases of this rare condition, one in his own practice and the other two in the practice of Mr. Dudgeon and Dr. Eyre. In one case the swelling came by itself, and there was no history of any injury; there was nothing distinctive about the pus, and the abscess healed, although slowly. The second case was that of a woman who ran a needle into the prepatellar bursa; suppuration followed, and the abscess was opened ten days later. There was no injury in the third case. In all a pure culture of the pneumococcus was isolated. There was no history of a previous pneumonia in any of the cases.

REFERENCE.—[1]*Lancet*, Aug. 1, 1908.

CALCULUS. *E. Hurry Fenwick, F.R.C.S.*

It has for long been recognized by the profession that a large number of cases of supposed appendicitis have subsequently proved to be merely stone in the right kidney or ureter. Usually the clinician

is to blame for the false diagnosis, but there are recorded cases in which either the two diseases co-exist or the symptoms are so exactly similar as to be clinically inseparable.

J. F. Erdmann[1] has quoted three cases of great value and of undoubted clinical difficulty, and pertinently remarks: "Pain in the lower right quadrant of the abdomen does not usually signify appendicitis, but may be associated with hernia, renal calculus (whether renal or ureteral in location), ovarian invasion, appendicitis, etc. It therefore behoves us, when seeing a patient complaining of pain in this region, to carefully eliminate each of these possibilities, and in so doing 'McBurney's point' when present, should carry weight only of the greatest elasticity rather than of definite and positive certainty." He considers that our difficulty in diagnosis arises only in the slow cases of appendicitis and in the types designated as "interval cases" in which no typical acute attack has ever been evidenced. On the contrary, only those cases of stone presenting slight evidence of impaction, or slight to no marked urinary, etc., symptoms are mistaken for appendicitis.

He gives the following points: Finally, for the exclusion of appendicitis or for the dual diagnosis of appendicitis and stone, the urine and its channels must be carefully examined. The microscopical evidences in urine analyses that weigh in the diagnosis of possible stone are the presence of blood, crystals of oxalates and urates in excess, and epithelial elements from the hilum and ureters. Blood may be present in the urine in cases of appendicitis, due either to a toxæmic nephritis (acute) or to some associated condition, as acute non-toxic and chronic nephritis or floating kidney, etc. **Blood, without other renal elements**, and in the absence of other pathological lesions of the bladder, urethra, etc., is the best diagnostic factor of stone we have, barring the evidences of a definite shadow in a radiograph or the scratch marks, made by contact with the stone, found upon a waxed ureteral catheter or probe that has been introduced into the ureter.

Cystoscopy. In stone in the ureter, the cystoscope usually shows a definite and diagnostic change in the mouth of the ureter upon the affected side, characterized by redness and eversion or thickening. Should the stone be in the ureteral orifice it may be seen as a dark object in or protruding from the ureteral opening.

Radiography. No better diagnostic means is at our disposal than the use of the X ray, as in practically all cases the shadow of the calculus is seen if the patient has been submitted to an expert radiographer. Failures in radiography are due to the subject being old and feeble and suffering from calcareous degeneration. Failure is also likely in too fat subjects and some few cases of uric acid or urate stones although sometimes these later varieties, i.e. the uric and urate stones, are depicted on the plates in the lean or moderately well-developed patients. In the cases where the symptoms point almost definitely to the presence of calculus, and no shadow is seen

upon the plate, it is necessary to examine the urinary channels—cystoscopy for a picture of the ureteral orifice, and the use of the waxed catheter or bougie in the ureters.

Stones simulating appendicitis are more likely to be found in that portion of the ureter which lies between the pelvic brim and a point just below the ischial spine, although in one instance mentioned by Erdmann the painful spot remained at McBurney's point, even after the appendicectomy. An X-ray photograph was therefore taken, and a stone revealed in the hilum of the kidney, arrested just at its junction with the ureter.

Operation.—The method of approach for calculi in the lower ureter will depend upon the position of the stone. When, as is most usual, the stone is in the portion of the ureter at the pelvic brim, it is a decidedly simple matter to approach it either by the transperitoneal route through a Deaver or Kammerer incision for removing the appendix, palpating the course of the ureter, and finding the location of the stone. Then by a narrow extraperitoneal dissection from the outer margin of the incision one rapidly reaches the site of the stone, the ureter and stone being held transperitoneally and pushing upwards. Then through the retroperitoneal dissection the ureter is incised over the stone, the stone expelled, and, the ureteral wound sutured or not, a small drain is put down to the trauma in the ureter. The peritoneum is then sutured, and the muscles and skin sutured to the emergence of the drain.

Erdmann prefers the transperitoneal localizing method, as it is rapid ; one can hook the fingers under the ureter and push it up without contusing it, as is done with the usual instruments required in the retroperitoneal method. In the retroperitoneal method one must make a very long incision and dissect up a large amount of the pelvic and abdominal anatomy before arriving at the site of the stone. When the stone is situated high in the abdomen or is in the hilum of the kidney, the incision is either the oblique lumbar or the incision of Israel. One need not hesitate in either of these operations—provided the renal association is not infective—to explore the appendix through a nick in the peritoneum, and remove it, as it is readily found even in the usual incision of Edebohls for nephrorrhaphy.

Pain.—In the great proportion of stone cases, no matter what position the calculus occupies, from the kidney to the ureteral insertion into the bladder, either one or combinations of the following painful areas are present: Testicular, penile, and inner surface of the thigh, pains are present. There is also an additional pain which is frequently elicited by pressure in the so-called McBurney area. This pain is to be differentiated from an appendicular one by the fact that rigidity of the abdominal muscles is not usually present ; that relaxation of pressure—Blumberg's sign (i.e., suddenly removing the palpating hand)—is not followed by the pain usually seen in acute appendicitis ; that pressure pain is not usually increased in a line toward the umbilicus, as in appendicitis, but may be so in a line toward

the inguinal canal following the course of the ureter; that coughing and deep respiratory pain, as seen in appendicitis is unusual in calculus cases. The onset in calculus colic is not usually accompanied by the generalized abdominal, epigastric or umbilical pain that we see so often in appendicitis. Vomiting may be present in both, although in greater frequency in appendicitis, and is only a corroborative factor when taken with others in a chain of symptoms that become positive guide-posts to either disease.

Elevation of temperature, usually present (one might say always, if taken by the rectum) in all acute and subacute appendicular invasions, is not present in calculus cases except there be an infective process in the kidney, etc.

Pulse.—This factor can only be relied upon when taken in series with vomiting, temperature, etc. While it is true that marked acceleration usually accompanies acute cases, it is also true that the difficulties in diagnosis arise in the recurring, interval, etc., types, and in these the pulse is relatively of no assistance.

The previous history must be carefully weighed in arriving at a conclusion as to either of these diseases. When one obtains a history of previous gastro-enteric difficulties, such as constipation, flatulence, sense of weight in the abdomen after eating, difficulties in digesting certain articles of food to such a degree as to cause the patient to shun them, a sense of weight in the right lower quadrant requiring the occasional placing of the hand to the side to adjust one's self, as it is often expressed then distinct and positive appendicular disease must be considered.

Pain in the back, loin, groin, inner surface of the thigh, urethra, testes and penis in the male, and vulva and urethra in the female, with occasional frequency of urination, definitely points to a possible renal calculus.

Stone in the Lower Ureter in Man.—Upon the operative treatment of stone impacted in the upper portions of the ureter, there is a unanimity of opinion. The portion of the ureter extending from the pelvis of the kidney down to the point where it leaves the lateral wall of the pelvis can be exposed with comparative ease by the lumbo-ilio-inguinal incision. The peritoneum is raised and the ureter, which always adheres to this structure, is defined. In the male subject, if not too fat, the portion of ureter between the pelvic wall and bladder can also be exposed. In a fat subject this may be very difficult, and in the female impossible owing to the broad ligament. In all cases when possible the stone should be displaced upwards and removed high up. It is not always necessary to make the lumbar incision: an inguinal incision only, as for exposing the external iliac vessels, need be employed. Again, there is but little difference of opinion as to the methods of reaching stones impacted in the vesical orifice of the ureter or in the portion which traverses the bladder wall. It is *not*, however, quite decided as to how stones should be approached when they are in the juxta-vesical portion of the ureter. Rigby[2] records

four male cases in which he approached the ureter by the para-sacral route with success. The description of the operation, which is not a new one, but which is most advantageously brought before the profession at the present juncture, is described as follows :—

"The patient is placed on the side opposite that on which the stone is impacted. The semi-prone position is employed, with the knees well flexed. The pelvis is raised by a small sand-bag. The edge of the coccyx on the affected side is well defined by palpation with the fingers from outside. An incision $3\frac{1}{2}$ in. in length is made, extending backwards from a point 2 in. from the posterior border of the anus. This incision is half an inch from and parallel with the edge of the coccyx ; it passes upwards and outwards, lying obliquely to the middle line of the body. The gluteus maximus muscle is exposed and its fibres completely divided for about two inches or more. The great sacrosciatic ligament and the posterior portion of the ischiorectal fossa are thus exposed. The small and great sacrosciatic ligaments are next divided ; and the spine of the ischium must be clearly defined with the fingers. This bony point is the first important landmark in the operation. The fibres of the coccygeus muscle and usually some of the posterior fibres of the levator ani come into view. The former are scratched through with a blunt dissector. The rectal fascia is next exposed and treated in the same manner. The sub-peritoneal space is then revealed, but the rectal wall itself is not defined.

"The ureter is next sought for in the subperitoneal tissue. This is the most difficult part of the operation, as the ureter remains closely connected to the peritoneum and is somewhat firmly embedded in the subperitoneal fat. It may also be surrounded by a plexus of vessels. The position of the spine of the ischium is again noted, and the ureter sought for, lying about $\frac{3}{4}$ in. above the spine in the axis of the operation wound. The best method of searching for the ureter is to use two pairs of long dissecting forceps. The peritoneum and subperitoneal tissue should be caught by one pair and pulled up from the depths of the cavity. By fixing the peritoneum in this manner the dissection is made much easier. If this precaution is not observed the peritoneum is easily stripped off the lateral wall of the pelvis and tends to sag further and further towards the opposite side, and deeper from the surface. If difficulty is still experienced in finding the ureter, and a stone cannot be palpated by a finger passed into the wound, deep pressure should be made by an assistant on the abdominal wall in the pelvic region. Further, it is especially important to avoid needless stripping up of the peritoneum, as this opens up a greater area of subperitoneal space, which may later become septic. If the ureter is still hidden, a search forwards towards the base of the bladder will expose the apex of the vesicula seminalis, and having defined this, the ureter will be found lying close to its inner border.

"When the ureter is found and the stone located, the latter is, if possible, displaced to another part of the canal. A longitudinal incision is then made and the stone extracted. A ureteric bougie

is then passed down to the bladder and upwards to the kidney. This procedure is important, as a stricture may also be present. The opening in the ureter is then closed by fine absorbent catgut sutures inserted after the Lembert principle; the mucous coat must on no account be penetrated by these sutures. A drainage tube is then passed down to the site of the incision. The sacrosciatic ligaments are now sutured with chromic catgut, then the fibres of the gluteus maximus, and finally the skin wound, leaving an opening at one end for the tube. The opening in the ureter need not necessarily be sutured, but in Rigby's cases they were inserted without any difficulty."

He sums up the advantages of this operation: (1) The abdominal wall is not incised, and therefore the risk of a ventral hernia is absent: (2) The ureter is directly approached from below, and the great disadvantage of stripping up the peritoneum and opening up the retroperitoneal space is avoided; (3) The hæmorrhage in this operation should be trifling, as no vessels of any size are encountered; (4) There is no risk of damage to the iliac vessels, either by carelessly stripping up the peritoneum, or later by the presence of the drainage tube; (5) The position of the wound ensures perfect drainage in the recumbent position; (6) In the inguinal operations this portion of the ureter lies at a greater depth from the skin surface, especially in a fat subject. The actual depth from the surface at which the ureter lay in one of his patients was by measurement 3½ in.; (7) The ureter can be pulled up within easy reach, so that sutures can be introduced accurately without any difficulty.

If the stone cannot be felt, there may be great difficulty in defining the ureter. In one case where a small stone was fixed in the para-ischial portion, the ureter could not be defined until a transperitoneal exploration was also made.

Stone in the Lower Ureter in Women.—Many stones in the woman are found in front of the broad ligament, between it and the termination of the ureter. Operation for their removal through the vagina is a comparatively simple matter. The field is exposed with a duck-bill speculum, and a cut is made directly over the ureter where the calculus is impacted. The ureter is seized with blunt hooks, and an incision is made large enough to push the stone through without tearing. Care should be taken not to allow the stone to slip back in the ureter above the site of impaction; this portion of the canal is dilated in consequence of urinary pressure, and the stone may easily slip back and escape above. A finger in the vagina behind the stone will guard against this, and, if there should be difficulty about extracting the stone, a small blunt hook may be slipped past it and the calculus hooked out. A catheter is run up to the kidney to make sure that there are no further stones, and it is well also to catheterize the ureter through the bladder to make sure that there is no stricture. It is best to drain the ureteric wound for four or five days.

Garceau[3] has devised another form of procedure for those stones caught near the base of the broad ligament. It occurred to him that

if the stones could be pushed down towards the vagina and kept there while the vagina was being incised, the cut would be a small one and the stone would serve as a guide on which to make the cut. He incised the anterior cul-de-sac, pushed back the peritoneum between the bladder and uterus as far as the broad ligament, then everted the broad ligament backward with the tip of the finger, caught the stone with the finger-tip crooked at the last joint, forced it down towards the vaginal outlet, cut on it with a very small incision, and squeezed it out. "In one case it was like squeezing a cherry stone out of a ripe cherry." Immediately on delivery the vaginal incision was closed with silver wire sutures. Some hæmorrhage occurred in the anterior cul-de-sac, and as it was not desired to take any more time, a few clamps were left on the vessels. The whole operation took ten minutes, and the stone was delivered in five minutes. The convalescence was not remarkable, and there was no fistula. Subsequent catheterization showed both ureters to be free.

References.—[1]*Med. Rec.* Mar. 14, 1908; [2]*Ann. Surg.* Nov. 1907; [3]*Jour. Amer. Med. Assoc.* June, 1907.

CANCER. (*See* Appendicitis, Surgical Treatment of; Bladder, Tumours of; Breast, Cancer of; Carcinoma, X Ray; Colon, Surgical Diseases of; Epithelioma; Gall-Bladder, Surgery of; Gastric and Pyloric Ulcer; Jejunum; Liver, Surgery of; Lymphatic Obstruction; Pancreas, Surgery of; Prostate, Surgery of; Rectum, Surgery of; Stomach, Diseases of; Testis, Malignant Disease of; Uterus, Diseases of.

CARBUNCLES AND BOILS, TREATMENT OF.

E. Graham Little, M.D., F.R.C.P.

J. and R. J. Reynolds[1] recommended the internal administration of large doses of **Acid. Sulphurici Dil.** (B. P.): 20 to 30 min. well diluted with water should be taken regularly every four hours. It is unnecessary to cut the local lesion, but carbolized vaseline may be applied on lint to the part. The treatment should be continued for a fortnight after the symptoms have disappeared. Successes are reported in all cases not complicated by diabetes.

A method which is said to abort boils is quoted.[2] The part is scrubbed with soap and water, washed with 50 per cent alcohol, and an alcohol compress applied and retained until the alcohol has evaporated. The part is again washed with soap and water, and the suds left to dry, no dressing being applied. A single treatment is said to be sufficient.

References.—[1]*Brit. Med. Jour.* Aug. 15, 1908; [2]*N. Y. Med. Jour.* Dec. 1907, in *Jour. Amer. Med. Sci.* Aug. 22, 1908.

CARCINOMA, X-RAY. *E. Graham Little, M.D., F.R.C.P.*

Porter and White[1] have made as complete a collection as possible of all cases of carcinoma resulting from X-ray work, excluding those instances of carcinoma developing on the site of lupus treated by X rays. Eleven such cases are reported, of which five proved fatal by

metastatic malignant growths. The best method of treating X-ray injuries was found, in a ten years' experience with a single case, to be by **Excision** of the skin affected and **Skin Grafting.** The following conclusions are adopted: (1) For the atrophic condition of the skin and telangiectasis resulting from X rays, nothing can be done; (2) Hypertrophies, keratosis, and warts may be treated at first on general lines; if this is unsuccessful, then excision with or without skin grafting, is recommended; (3) Excision and grafting are recommended for recurrent fissures; (4) All ulcerations which under ordinary treatment remain unhealed after three months should be thoroughly excised and very carefully examined; skin grafting or amputation is subsequently to be practised according to the nature of the growth as revealed by examination of the excised portions.

REFERENCE. [1] *Ann. Surg.* Nov. 1907.

CATAPHORESIS AND RECTAL DISEASE. (See RECTUM.)

CATGUT, PREPARATION OF. *Prentice Leak, M.D., F.R.C.S.*

Lord Lister[1] gives the following directions for preparing catgut which have not before been published. Chromium sulphate he found varied extremely in quality according to the manufacturer who supplied it, but a perfectly satisfactory salt was prepared by adding a solution of sulphurous acid (P.B.) to solution of chromic acid until the rich orange brown of the latter has passed through grass green to the pure blue of chromium sulphate. When this has occurred no more should be added, since free sulphurous acid produces a precipitate with bichloride of mercury, and would thus, in proportion to its amount, withdraw the germicide from solution when the two liquids are mixed. In order to make quite sure that no free sulphurous acid is present, it is well to keep a few drops of the chromic acid liquid in reserve, and add them when the blue colour has appeared, so as to restore the green tint. Another point that requires attention arises from the fact that the P.B. solution of sulphurous acid as obtained from the chemist is generally somewhat deficient in the amount of SO_2 in consequence of loss by volatilization. Hence it is necessary to use a smaller quantity of water for dissolving the chromic acid, and when the proper tint has been obtained, add enough distilled water to bring the liquid to the requisite measure.

The preparing liquid must be twenty times the weight of the catgut. So for 40 gr. of catgut, 800 gr. of preparing liquid are required. It is made by mixing two liquids: the chromate sulphate liquid and the sublimate liquid. The sublimate liquid is: corrosive sublimate 2 gr., distilled water 320 gr. The sublimate may be dissolved by heat, but the solution must be used cold. The chromium sulphate liquid is prepared thus: chromic acid 4 gr., distilled water 24 c.c.: add to this as much sulphurous acid (P.B. solution) as gives a green colour. If more is added the solution becomes blue. Enough distilled water is added to bring the green liquid up to 480 gr.; then add the sublimate

liquid. The catgut is kept twenty-four hours in the preparing liquid, and is then dried on the stretch.

N.B.—It is essential that the CrO_2 and SO_2 solutions be mixed before the $HgCl_2$ solution is added. Catgut prepared in this way remains actively antiseptic in its substance for an indefinite period. But while the substance of the catgut is not only aseptic, but powerfully antiseptic, its dry surface is liable to contamination by contact with septic material, and it is essential that before being used it be washed with some trustworthy germicidal liquid. Lord Lister's practice has been to put the catgut, like the instruments, in 1–20 solution of carbolic acid about a quarter of an hour before the operation is begun. Any catgut that remains may be afterwards kept in a similar solution for any length of time without disadvantage. The essential precaution of purifying the surface of catgut is, he fears, sometimes overlooked, the result being occasional suppuration attributed to defect in the ligature, while it is really the fault of the surgeon.

REFERENCE.—[1]*Brit. Med. Jour.* Jan. 18, 1908.

CEREBROSPINAL MENINGITIS (Epidemic).

Linnæus Edford La Fétra, M.D., New York.

As the result of various epidemics of cerebrospinal meningitis which have occurred in various parts of the world during the past few years, there have been redoubled efforts towards producing a serum which could be employed successfully in combating the disease. One of the earliest to be used was that by Kolle and Wassermann. Other sera that have been employed extensively in Germany and Austria are the Jochmann and the Ruppel products. In England all of the above, together with that prepared by Burroughs, Wellcome & Co., have been used. In Germany the Kolle-Wassermann serum has been prepared by the Royal Institute for Infectious Diseases in Berlin, so that it has been employed more extensively in Europe than any other. Reading carefully the cases reported, the conclusion is reached that there is probably some benefit derived from the use of these various sera, provided they are given in large doses and are injected into the spinal canal. At first the serum was employed subcutaneously, in doses of 5 cc. for a child under one year, 10 cc. for older children, and 20 cc. for adults. The Kolle-Wassermann serum contains 0·4 per cent of carbolic acid, so that the size of the dose is somewhat limited by the presence of this acid. It was found comparatively early that these subcutaneous injections had practically no effect, so that gradually the serum was injected more and more often into the spinal canal after lumbar puncture. One of the earliest reports was that of Hellmer, who injected intraspinally six patients. His results with smaller doses were all practically nil. Wassermann, discussing Hellmer's paper, at that time reported a mortality of 40 per cent in 102 cases, and advised doses of 20 cc. He considered his serum opsotic and antitoxic. Schultz reported the use of serum subcutaneously as having no effect. Meyer about the same

time reported the employment of Jochmann's serum in eight cases with practically no results beyond a temperature elevation following the injection. Raczynski employed this same serum in nine cases, and thought there was no influence upon the disease. Toebben had 34 per cent mortality in 29 cases, using Wassermann's serum.

During the present year Levy has reported fair results by using the Kolle-Wassermann serum intraspinally in seventeen cases. A moribund patient was excluded from the statistics, and his mortality in these cases was only one, that is, 6·25 per cent. Levy's statistics are the most favourable that have been produced, and are open to the objection that they have been obtained from too small a number of patients. Arnold, reviewing the whole subject, comes to the conclusion that Jochmann's antimeningitic serum in sufficiently large intraspinal doses must be regarded as having a curative influence upon the disease.

In England the results of serum treatment up to January, 1908, were reviewed by Claude B. Ker. His conclusions are not very enthusiastic, as he contents himself with the opinion that when given directly into the spinal canal a better result is occasionally obtained than can be reasonably expected without serum treatment.

The greatest advance in the use of the serum has come from experiments begun by Flexner, of the Rockefeller Institute for Medical Research in New York. These investigations were begun in 1905. During the year 1904 there appeared in New York the greatest epidemic of this disease which has occurred since 1872, more than six thousand cases being reported to the Department of Health. The Mayor of New York appointed a Commission to investigate the causes, nature, and treatment of the disease. Dr. Flexner was a member of this commission, and it was under its auspices that his work was begun. After a long series of experiments with animals it was found possible to develop a serum in the horse which was curative of experimental meningococcus meningitis in monkeys. The next step was the proof that the serum is harmless, and finally it was tried in cases of human cerebrospinal meningitis. From the beginning, Flexner's plan was to inject the serum into the spinal canal after withdrawal of cerebrospinal fluid. It is probably largely to this method of employment that the main credit for the great success of this serum is due. When employed subcutaneously it has like the Kolle-Wassermann and other serums, practically no effect.

It is now (November 1908) about a year since the serum of Flexner and Jobling has been in use, and there have accumulated reports of over four hundred cases of proved meningococcus meningitis treated by injection of this serum into the cerebrospinal canal. Flexner, writing in October, 1908, gives the results of the case reports he had received up to that time. The four hundred cases upon which his analysis is based occurred in different and widely separated parts of the United States, Canada, and Great Britain, sometimes in small epidemics, as in Ohio, California, Belfast, and Edinburgh; at other times as sporadic outbreaks, in Cleveland, Boston, Baltimore,

Cincinnati, and Philadelphia. In every case the diagnosis was made by bacteriological examination. The reports of the cases were supplied by physicians who had employed the serum either in hospital or in private practice. Inasmuch as these reports will be the basis for the employment of this serum throughout the world, it is deemed sufficiently important to reproduce many of the details of Flexner's analysis. The effects of the serum were studied according to the age of the patients, the period of the disease when the serum was first injected, the number of injections, the dosage, the effects on the temperature and on subjective and objective symptoms of the disease, the effect upon the meningococcus in the spinal exudate, and the manner of recovery, whether by slow improvement or by abrupt termination of the symptoms. Except for the fact that all cases that died in less than twenty-four hours after the first dose of serum were excluded from the tabulations, there was no selection of the cases.

Result according to Ages of Patients.—After excluding the moribund cases there were 391 subject to tabulation. Of these, 295 recovered, giving a mortality of 25 per cent, and a percentage of recovery of 75.

	No. of Cases	Recovered	Died	Mortality
Under 1 year	22	11	11	50·0 per cent
Between 1 and 2 years	19	11	8	42·1 ,,
Between 2 and 5 years	68	52	16	23·5 ,,
Between 5 and 10 years	79	70	9	11·4 ,,
Between 10 and 20 years	105	80	25	23·8 ,,
Over 20 years	87	64	23	26·4 ,,
Age not given	13	7	6	46·1 ,,

The youngest recovery was a baby one month old. The latest case of treatment was that of a child one year of age, who was in its fourth month of the disease when the injections were begun. The child died. The high mortality among cases over twenty years of age Flexner explains in part by saying that the larger number of these patients were treated by various physicians without experience with the serum.

Results according to the Period of Injection.—Although it was difficult in many cases to determine positively the exact time of onset, there were 361 reports in which this point was sufficiently definite to allow of a tabulation.

Period of Injection of Serum	No. of Cases	Recovered	Died	Mortality
First to third day ..	123	107	16	16·5 per cent
Fourth to seventh day	126	96	30	23·8 ,,
Later than seventh day	112	73	39	35·0 ,,

From the above table it is obvious that the earlier the injection the more beneficial the influence of the serum. Notwithstanding this, there have been cases reported in which the serum was injected at a late period with strongly favourable results, as in the case reported by Dunn. It is Flexner's opinion that so long as the diplococcus is still present in the meningeal exudate, and the mechanical damage to

the anatomical structure is not irreparable the serum holds out hope of considerable benefit.

Method of Termination of the Symptoms.—In 273 instances it was possible to determine from the reports the manner in which the disease terminated, whether gradually or abruptly. Two hundred cases terminated by "lysis" and 73 by "crisis." In regard to the duration of the active symptoms of the disease in cases treated by serum, it is of importance and interest to note that of 350 cases that recovered in the New York epidemic of 1904 the disease lasted for five weeks or longer in 175 cases. Among the serum-treated cases which recovered in this series, 228 could be tabulated with regard to this point, and the average duration of active symptoms was found to be about eleven days.

Influence on Diplococci, Spinal Exudate, and Leucocytosis.—Very soon after the injections are begun, the meningococci tend to be greatly reduced in numbers, to disappear from the fluid portion of the exudate, to become wholly intracellular, to present certain changes in appearance, such as swelling and fragmentation, and to stain diffusely and indistinctly; coincidently, moreover, they lose their viability in cultures. There is little doubt that much of the beneficial effect of the serum injections must arise from the restriction of multiplication and from the greater phagocytosis of the diplococci. The exudate loses its turbidity under the influence of the serum injections, there being in many cases a rapid change from a purulent to a clear exudate after the serum has been injected. Upon the general leucocytosis there is often effected a very rapid and even critical fall in the number of leucocytes in those cases which are benefited by the serum injections.

The reverse is found in those cases not responding to the serum or responding imperfectly, so that increase in the turbidity of the exudate, persistence of the diplococci with retention of viability after repeated injections, and rise in leucocytosis, are to be taken as unfavourable indications. In regard to relapses, although the data are as yet few, the general statement can be made that relapses are attended or ushered in by an increased exudate of leucocytes into the meninges, higher general leucocytosis, and the reappearance of, or increase in, the numbers of diplococci in the spinal fluid.

As regards the degree of recovery, Flexner states that the impression he had from his first and smallest series of cases was to the effect that in the great majority of instances recovery would be complete. The reports from this larger series of cases confirm the early view. The number of complications which arose was small, and the only persistent defect was deafness, which occurred in a few instances, and even in these was more often noted early in the disease before the serum injections were begun.

Among Flexner's cases was a series treated by Dr. Kebbe of Belfast, with most gratifying results. He gives the results of the use of the serum prepared by Flexner and Jobling in thirty-two cases. Of these, twenty-two recovered, eight died, and two were still under

treatment, giving a mortality of 26·6 per cent. Robb contrasts this mortality of cases treated in hospital by serum with those treated at home without serum during identically the same period, the mortality in the latter being 85·2 per cent. Among 275 cases treated without serum in the previous eight months in the same epidemic in Belfast, 199 died, or 72 per cent.

Dunn, in March, 1908, reported the use of Flexner's and Jobling's serum in fifteen cases. Later, at the American Pediatric Society meeting, he reported his results in a series of forty consecutive cases with a mortality of 22½ per cent.

At the annual meeting of the American Pediatric Society in May, 1908, the main topic for discussion was the serum treatment of cerebrospinal meningitis. Papers were read by Flexner, Churchill, Dunn, Koplik, and Knox, and the discussion which followed was participated in by many of the members who had seen the results of serum treatment. The consensus of opinion was that in every case lumbar puncture should be done as early as possible. If the fluid obtained is turbid, from 20 to 30 cc. of the antimeningitis serum, warmed to body temperature, should at once be injected into the spinal cord, without waiting for the bacteriological examination of the spinal fluid withdrawn. Turbid or purulent fluid will generally show meningococci. If it should show pyogenic organisms or pneumococci, no harm will have been done. If the fluid drawn is clear, it should be carefully examined for meningococci; for although clear fluid generally shows only tubercle bacilli, meningococci have been found in clear fluid both in very early and in late stages of epidemic cerebrospinal meningitis. The injection should be repeated every day or two until the symptoms are relieved.

It is significant that the more recent reports of the use of the serum show the best results. This would indicate that the knowledge concerning the time, dosage, and frequency of administration of the serum is increasing It will probably prove true, as with diphtheria antitoxin, that the earlier the serum is administered, before marked inflammatory changes have occurred, the greater will be its efficacy.

Technique of the Injections.—Lumbar puncture is made in the usual way, as given in the *Medical Annual* last year, and as much cerebrospinal fluid withdrawn as possible. This has the double effect of lessening the pressure and removing a large number of diplococci. The patient should be in a sitting posture, with the head strongly flexed, in order to encourage the flow of the fluid. Robb, of Belfast, washes out the spinal canal with a warm sterile salt solution, particularly in purulent cases. When the serum is to be injected, the patient should be lying down, with head extended, in order to facilitate the entrance of the fluid. The serum should be warmed and injected slowly, at least as much being used as the amount of fluid withdrawn, often somewhat more. Warming the fluid is important, since the patients experience a good deal of pain if the serum is employed cold. Very little force should be used with the syringe.

Dosage.—From 30 to 40 cc. is the initial dose in moderately severe cases. It is to be repeated in twelve hours if there is no improvement, and after that daily. Frequently a single dose is enough. It is not necessary that it be given during the first twenty-four hours of the disease, but by far the best results have been obtained when the injections were begun during the first three days. The doses should be repeated until the symptoms improve.

Two important facts stand out with reference to the treatment of this disease by the serum of Flexner and Jobling: (1) The reduction of mortality and amelioration of symptoms; and (2) The possibility of following objectively under the microscope the effect of the injections.

More striking, perhaps, than the reduction in mortality, at least for any individual observer, is the amelioration of the symptoms following the use of the serum. The temperature curve has been markedly influenced. Either there has been a rapid drop or "crisis" in the temperature within forty-eight hours, or there has been a "lysis" of the fever in seven or eight days. Along with the subsidence of the fever there has been an improvement in all the other symptoms—a cessation of the pain and hyperæsthesia, a clearing of the mental state, resumption of interest in surroundings, and ability to take food. The opisthotonos and Kernig's sign were the last of the symptoms to be influenced, often persisting for days after the patient was otherwise apparently well. The whole course of the disease, moreover, has been very much shortened to a week or ten days in many instances. This is in marked contrast to the length of the disease in former cases of recovery. Of 350 cases that recovered in the New York epidemic of 1904, the disease lasted for five weeks or longer in 175 cases.

Lastly, the effect of the serum can be tested objectively under the microscope; for important changes take place in the cerebrospinal fluid after its use. Following the first injections there is observed a diminution in the number of meningococci in the spinal fluid, a lessening of those in the cells, the organisms become swollen and indistinct, and, moreover, fail to grow in cultures. Finally, they disappear altogether, and the amount of the cerebrospinal fluid becomes rapidly less. This effect on the organism, since it can be definitely followed day to day furnishes objective proof of the efficacy of the serum; and this evidence is the more valuable since it can be followed in the laboratory by a disinterested investigator, thus ruling out the personal equation of enthusiasts for the treatment.

BIBLIOGRAPHY.—Kolle and Wassermann, *Deut. med. Woch.* Ap. 19, 1906; Jochmann, *Ibid.* 1906, No. 20; Ruppel, *Berl. klin. Woch.* No. 34; Schone, *Ther. d. Gegenw.* Feb. 1907; Flexner, *Jour. Exper. Med.* Mar. 1907, and *N. Y. Med. Jour.* Nov. 30, 1907; Hellmer, *Berl. klin. Woch.* Nov. 4, 1907; Foebben, *Munch. med. Woch.* Dec. 3, 1907; Schultz, *Berl. klin. Woch.* Dec. 30, 1907; Kerr, *Pract.* Jan. 1908; Robb, *Brit. Med. Jour.* Feb. 15, 1908; Levy, *Munch. med. Woch.* Feb. 25, 1908; Dunn, *Bost. Med. and Surg. Jour.* Mar. 19, 1908; Raczynski, *Wien. klin. Woch.* 1907, No. 52; Arnold, *Centralbl. f. Bakt. Med.* Ap. 25, 1908.

CESTODE LARVA, PROLIFERATING.

E. Graham Little, M.D., F.R.C.P.

Stiles[1] reports an exceptional case of the occurrence of a proliferating cestode larva (*Sparganum proliferum*) in man in Florida, in which very numerous ("thousands of") nodules situated deeply in the skin and connective tissue of a male patient, aged 48, were found to contain worms. The affection had persisted for twenty-five years, and had commenced while the patient, who was a fisherman, was living chiefly on smoked and dried fish, raw oysters, scallops, and clams. A similar case had apparently occurred in Florida a few years previously. Stiles quotes another similar case recorded by Ijima in Tokyo, in which the patient, who was a woman aged 31 at the time when the disease was noted, suffered from a swollen condition of the integument resembling elephantiasis, with scattered nodules which were demonstrated to contain encapsuled worms of cestode type. These three cases would appear to be all that have been described of this curious disease. "The cestode is a larval form, without suckers on the head, and without any primordium of genital organs." The most striking feature of the worm is its irregular shape, with tendency to proliferation by forming supernumerary heads. The capsule containing them is situated in the corium and in the intermuscular connective tissue, but not in the muscle itself. Clinically, the appearance is of acne-like prominences slightly depigmented, and very numerous: in the Florida case they were counted "by thousands; in the Japanese instance it was estimated that there were a thousand to every 100 cc. of tissue." The worms were seen alive only in the Japanese case, and besides the encapsuled form were found free in the connective tissue. The largest was 12 mm. long by 2·5 mm. broad. When encysted, budding usually takes place, producing complicated forms. The organism is classed as a dibothriocephalid larva, similar to the sparganum of Diesing and the *Sparganum mansoni*, and the name *Sparganum proliferum* is proposed for it.

Reference.—[1]*Journ. Cutan. Dis.* Aug. 1908.

CHILBLAINS. *E. Graham Little, M.D., F.R.C.P.*

Gardiner[1] lays stress on the investigation of the condition of blood supply, disorders of which are the underlying factors in the production of chilblains. Thus the blood itself may be diseased, or the vascular mechanism, including the arteries, veins, and the heart, may be at fault. Iron and cod-liver oil should not be ordered in a haphazard fashion. **Calcium Salts** are useful in some cases (calcium chloride 15 gr., t.d.s.) and a combination of **Tinct. Strophanthi** with **Liquor Trinitrini** is especially recommended in senile sufferers. Foot and hand wear of a loose, warm, and unirritating character must be chosen. **Massage** as a preventive is useful when there is as yet no pain. **Ichthyol** and **Formalin**, the former as an ointment with lanolin in 10 to 20 per cent strength, should be spread thickly on linen and applied at night. Formalin also, in ointment of 10 to 50 per cent strength, is similarly

applied, and is rather more energetic than ichthyol. The **Faradic** and **Galvanic Currents** are old methods whose efficiency is too often forgotten, and are especially applicable in early stages and for prevention of attacks. **X Rays** and **High-frequency Currents** are even more powerful and probably of more permanent benefit—X rays in doses of ten minutes' duration with a hard tube and with 5 ma. in the secondary circuit. When the chilblains are ulcerated the following ointment may be used:

R	Hydrarg. Ammon.	gr. v	Pulv. Zinci Oxidi	āā ʒij
	Ichthyolis	℥x	Vaselini	ʒss
	Pulv. Amyli			

This should be freely spread on linen and frequently changed. Cases which do not yield to such treatment may be suspected to be lupus erythematosus.

REFERENCE.—[1] *Pract.* Feb. 1905.

CHLOROSIS.

Vol. 1899, p. 123.—Taylor says treatment should be fourfold: (1) **Aperients.** Of these a morning saline draught is best (Sodii Sulphat. ʒj or ʒij in half a tumbler of water on rising). (2) **Iron.** Blaud's Pill is a useful routine prescription: Ferri Sulphat. gr. iss. Potass. Carbonatis gr. iss. Sacchari gr. j. Tragacanth gr. ss. Ft. pil. j. Two pills three times daily after meals. A pleasant form for the above is the jelloid of iron. Citrate of iron and ammonia is often preferable, e.g., where the patient has slight dyspepsia, in 10-gr. doses, with Syrup ʒj. and Water to ʒj. (3) **Clothes** must be loose, therefore stays are to be discarded. (4) Regular out-of-door **Exercise.**

CHOLECYSTITIS. (*See* GALL-BLADDER, SURGERY OF.)

CHOLERA. *J. W. W. Stephens, M.D.*

Braddock[1] describes the treatment adopted by him in Siam in cases of cholera. The patient first receives:

R	Cocaine Hydrochloride	gr. $\frac{1}{10}$	Pepsin	gr. $\frac{1}{4}$
	Creosote	℥ $\frac{1}{8}$	Tinct. Nux Vomica	℥ $\frac{1}{8}$
	Cerium Oxalate	gr. ij		

Four to six of these tablets are given at once and the patient is instructed to chew them thoroughly. Three to five minutes afterwards the following tablet is given:—

R	Morphine Sulphate	gr. $\frac{1}{4}$	Capsicum	
	Hyoscyamus	gr. $\frac{1}{2}$	Camphor	āā gr. $\frac{1}{4}$
	Nitroglycerin	gr. $\frac{1}{100}$	Tincture of Digitalis	gtt. v
	Citrated Caffeine	gr. $\frac{1}{2}$		

One or two are given, to be thoroughly chewed. Every few minutes, until the pulse can be felt at the wrist, the tablet of nitroglycerin $\frac{1}{100}$ min., with 2 min. of the tincture of digitalis, is given. As soon as the pulse can be felt the prognosis is more favourable; the patient will certainly be lost unless nitroglycerin and digitalis are given "for effect." The author has given as many as 20 or 30 tablets in the course of a few hours. In the meantime the patient has:

R	Tincture of Eucalyptus	ʒiv	Tincture of Capsicum	℥xxx
	Spirit of Camphor	ʒij		

The mixture is taken as one dose with an equal quantity of water, and teaspoonful to tablespoonful doses of tincture of eucalyptus are given concurrently with the other medicine every hour until reaction sets in. Mustard plasters and heat should also be used. To prevent dehydration of the tissues the author gives heroic doses of tannic acid 10 gr. after every motion of the bowels, or 20 gr. every hour. This treatment produces reaction in a great many patients, but suppression of urine may now set in. This is treated by the eucalyptus in addition to the digitalis and caffeine. A vital point in the treatment is that all food, even a slice of orange or teaspoonful of boiled rice, must be absolutely prohibited for thirty-six hours or longer. Vomiting and diarrhœa return if this rule is broken. Otherwise recovery is rapid, and patients who are supposed to be dead are within a week found "walking around."

P. Bakaleinik,[2] to check the vomiting, gives ice internally, or five or six drops of tincture of iodine in a little warm water. Warm baths lasting for two to three minutes may also be used. Sinapisms are applied to the epigastrium, and if the pulse allows of it, morphia is given subcutaneously. When the vomiting is checked the following is administered :—

R	Salicylic Acid	0·60 gram	Ol. Ricini	25–30 grams
	Naphthalin	0·25 gram		

This mixture is prepared by triturating the ingredients in a mortar for a quarter of an hour; 15 grams of the mixture are given daily. Cardiac tonics, abdominal friction, etc., should also be employed.

References.—[1]*Jour. Amer. Med. Assoc.* June 15, 1907; [2]*Sem. Méd.* Oct. 2, 1907.

CHOREA.

Prof. G. F. Still, M.D., F.R.C.P.

Four-fifths of the cases of chorea, according to Philip,[1] occur between the ages of five and fifteen years, and of the relatively small group of those which begin later, from sixteen to thirty, the great majority are in females. Family history often shows heredity in one of two directions, either a history of rheumatism or a neuropathic tendency.

Etiology.—The varying characters of the symptoms and their extreme violence in some cases are much in favour of the view that the disease is due to some irritation. Various toxins may act as irritants. It is to be kept in view that chorea occurs not only with rheumatism, but after scarlet fever, measles, small-pox, diphtheria, enteric fever, cholera, pneumonia, whooping-cough, pyæmia, and gonorrhœa. These antecedents are mentioned by Philip as if they bore some causal relation to chorea; he mentions also sore throat of "several types" as associated with this disease.

McCarthy,[2] discussing the relation of chorea to rheumatism, concludes that Sydenham's chorea may be considered the result of an acute infectious toxic process of the cerebral nervous system, but that until acute articular rheumatism is distinctly counted as an acute specific infection with a distinct and specific bacterial cause, it is not

only not scientific but is also useless, to consider every case of chorea, and every apparent case of endocarditis, pericarditis or myocarditis as rheumatic. On account of the frequency of disease of the serous membranes and more particularly of the endocardium and myocardium, even mild cases of chorea should be considered as a serious disease in childhood, and the patient should be confined to bed until the symptoms have subsided for a period of four to six weeks at least; and in every case the heart should be frequently examined, and protected from over-exertion. He would have all nervous, high-strung children carefully guarded against the worry and overwork involved by school examinations.

Sachs[3] has emphasised the relation of chorea to various forms of septicæmia. He says there is no more justice in claiming an infectious origin for all cases of chorea than there would be in claiming such for all cases of jaundice, although we know that jaundice occasionally accompanies a general pyæmic infection. But, as he confuses Sydenham's chorea with post-hemiplegic so-called—"chorea," most people would agree with him that the term chorea used in this loose way may apply to several conditions which are not infectious. There is little hope of arriving at any clear understanding of the etiology of chorea and its relations, so long as observers fail to distinguish between the ordinary Sydenham's chorea and other irregularities of movement. He mentions the various streptococci and staphylococci which have been found in supposed chorea, but makes no mention of the valuable work on this subject done by Poynton and Paine, who have demonstrated the presence of a diplococcus, which they have shown reason to regard as the specific micro organism of rheumatism in the lymph spaces about the vessels in the superficial part of the cortex in chorea.

Symptoms. There is no need to describe the irregular movements of Sydenham's chorea: they are familiar enough. Gordon Sharp[4] points out that the deep reflexes vary much in chorea. This disease, he says, is a complex combination of pathological conditions: (1) The whole motor tract, from the cortex above down to the motor nerve endings in the muscles, may suffer; (2) All the various portions of the tract may not suffer in an equal degree. Thus the condition of the reflexes will depend on the extent of the tract affected, as well as on the severity with which the various portions are attacked. One portion may be stimulated, while another may be depressed, or inhibited, and in yet another instance the whole tract may suffer inhibition, and so in this way we may account for the cases of paralytic chorea. If the upper motor neuron is severely affected, its restraining influence on the lower neuron is removed, and hence the reflexes are excited. Experience testifies to the correctness of this assertion, for in those patients in whom the speech is affected (indicating that the upper neuron is attacked) the knee-jerks are generally exaggerated. On the other hand, if the lower neuron is specially attacked, the knee-jerks may be depressed, or even in abeyance.

Langmead[5] mentions certain pupillary symptoms present in chorea; hippus—rhythmical oscillatory movements of the iris—is sometimes present; the pupils may not react synchronously, contraction of the pupils to light is ill-sustained, and one may begin to dilate, as if tired of contracting, before the other; the pupils may show varying inequality, now one, now the other, being the larger; the pupil may become eccentric, especially when it is contracted. Langmead says that he has not found the hippus, the altered accommodation, or the eccentricity of the pupils in any other general condition, except in articular or cardiac rheumatism, a point of interest in view of the common etiology of rheumatism and chorea.

Carpenter[6] records a case of chorea in a girl, aged 3½, in whom, together with chorea, there was double optic neuritis: the temperature rose to 106·4°. The child died; and the necropsy showed nothing abnormal in the brain, and there was only slight thickening of the mitral valve.

Diagnosis.—Chorea must be sharply differentiated from heart-spasm or "tic." Graves[7] mentions, as points of distinction, the following: General nutrition is impaired in chorea, not in tic; the facies is dull or stupid in chorea, quick and vivacious in tic; there is often coprolalia or echolalia in tic, never in chorea; the movement in tic is localized to one part, in chorea it is more or less general; there is never inco-ordination of voluntary movement in tic, whereas this is the main feature of chorea; tic is a habit, chorea is a disease.

Treatment.—**Rest** is the most important item in the treatment of chorea. Ruhräh[8] describes a modified Weir-Mitchell method which he found most useful without arsenic or any other medicine, and that therewith mild cases were cured in two to three days, severe ones in two to three weeks, and the average stay required in hospital was thirty-five days.

Koplik[9] points out the dangers of **Arsenic** treatment, and says very sensibly that it is incorrect to apply the same therapy in all cases; there are some children in whom arsenic acts as a direct poison, and others in whom the drug is well borne. The effect of arsenic on the kidneys is specially to be remembered. In some of his cases, before there was any stomach uneasiness or puffiness of the eyelids, a trace of albumin was found in the urine. If the administration of this drug was continued, casts would appear, and sometimes blood-cells; the urine became normal on stopping the arsenic. As little as five drops of the liquor arsenicalis, three times a day, was sufficient to cause such symptoms in a child of five or six years. One danger was found to be the deterioration of Fowler's solution when kept for some time; the solution evaporated, and so became more concentrated, and unwittingly a much larger dose was given than intended. Koplik discountenances the isolation of a child with chorea in a darkened room. In the moderately severe cases he would give moderate doses of **Sodium Salicylate** for its alkaline effect.

Gordon Sharp (loc. cit.) considers it necessary to saturate the tissues rapidly with arsenic. For children of eight to fifteen years he orders:

R	Liq. Arsenicalis	℥ss	Aq. Chloroformi	℥vj
	Tinct. Capsici	ℿxxv	Aq.	ad ℥xij
	Ext. Glycyrrhizæ Liquid.	℥ss		

℥ss three times a day immediately after meals.

If at the end of a week there is no improvement, he increases the amount of liq. arsenicalis in the mixture to 300 min. It may be laid down as a working rule that if arsenic is going to do good in chorea it will show its beneficial action within the first fortnight. When the remedy is doing good he continues it till the patient can walk along a straight line, and stand on the leg of the affected side with steadiness. After all movements have ceased, the patient is put upon:—

R	Sod. Bicarb.	℥ij	Aq. Chloroformi	℥vj
	Tinct. Capsici	ℿxxv	Aq.	ad ℥xij
	Ext. Glycyrrhizæ Liquid.	℥j		

℥ss three times a day after meals.

This latter mixture is given, so he says, because it "washes the arsenic out of the tissues": but he admits that the statement may not be scientific.

Voelcker[10] says the treatment should be: (1) General: (2) Symptomatic: and (3) Specific.

1. *General.*—In the early stage of nervous irritability, all scolding and schooling and teasing are to be avoided: the patient should lie down part of the day: and if the child like to amuse itself with books, or sewing, there is no harm in this. A warm bath at night may secure sleep.

2. *Symptomatic.* To prevent mechanical injury from the choreic movements, it is well to wrap the child in a blanket and tuck him firmly in bed; and the sides of the bed may need to be padded. Nothing is more satisfactory in the way of external applications than **Hot Packs**, in which the child may be left for several hours. Troublesome insomnia is sometimes overcome in this way. **Cold Douches** and **Tepid Sponging** are of value only during convalescence. **Massage** is of value chiefly when the movements are subsiding, and when there is much wasting and loss of power after chorea.

3. *Specific.* Voelcker does not use arsenic in the acute stages, though he considers it of value in convalescence and in the paralytic forms of chorea. Ergot he has not found of much value. Sodium salicylate as recommended by Dr. Lees (in doses of 400 to 500 gr. per diem) has not been very successful in Dr. Voelcker's own experience; but his dosage has been somewhat less. In uncomplicated chorea he has seen the best results from sedatives. **Chloretone** especially has seemed useful, but it is apt to make the children too drowsy, and sometimes produces an erythematous rash, and the eyes get a puffy appearance as in whooping-cough, but without albuminuria. **Bromural** has not seemed more useful than chloretone:

but like **Trional** is of value in some cases. This last drug has a very beneficial effect in chorea. The only unfavourable result was rather vivid dreams. It may be prescribed thus :—

R	Trional	gr. xv	Gum Arab.	gr. iij
	Pulv. Sacch. Alb.	ʒij	Aq. Flor Aurantii	ʒiiss
	Gum. Tragacanthæ	gr. iij	Aq. Laurocerasi	ʒss

M. ft. emuls. One-third part to be taken in milk or water as a single dose.

Five grains of trional can be given three times a day to a child over four years ; but the dose should soon be increased to 5 gr. every six hours, or even every four hours. It is more advantageous to give the smaller doses at shorter intervals than the larger at longer intervals.

Wall[11] has found **Aspirin** of more value than either arsenic or sodium salicylate. The danger of producing severe vomiting by aspirin can be avoided by giving it only when there is food in the stomach. Aspirin should never be given in tabloid form, but always as a powder ; in large doses it may cause hæmaturia.

References.—[1]*Brit. Med. Jour.* Feb. 15, 1908 ; [2]*Brit. Jour. Child. Dis.* Mar. 1908, p. 109 ; [3]*Med. Rec.* Mar. 28, 1908 ; [4]*Pract.* Feb. 1908 ; [5]*Lancet*, Jan. 18, 1908 ; [6]*Ibid.* Nov. 30, 1907 ; [7]*Med. Rec.* Aug. 1907, p. 315 ; [8]*Arch. Pediatr.* vol. xxv. p. 101 ; [9]*Med. Rec.* May 18, 1908 ; [10]*Folia Therap.* Ap. 1908 ; [11]*Med. Press*, May 20, 1908.

CHOREA. *Purves Stewart, M.D.*

Every year some new drug is vaunted for the treatment of chorea. In spite of the dogmatism with which various clinicians proclaim the merits of particular remedies, it must be confessed that we do not yet possess a specific remedy for the disease. Baccelli, of Rome, has for some time urged the value of **Monobromate of Camphor**, and Bernardo[1] relates an instructive case of severe chorea in a child of 9 in whom arsenic had been tried for a week, and failed to arrest the steady progress of the disease. Monobromate of camphor was then begun (15 gr. daily), and pushed to a maximum total of 30 gr. daily. After four or five days the violence of the movements began to abate. The monobromate of camphor was then interrupted and arsenic substituted ; the patient at once relapsed. After a few days the camphor salt was resumed and again pushed up rapidly to 30 gr. daily. Improvement at once took place, and in the course of eight weeks the patient was cured, no relapse having occurred two years later, when the case was published.

Reference.—[1]*Il Policl.* Oct. 4, 1908, p. 1267.

CHYLOTHORAX. *Joseph J. Perkins, M.A., M.B., F.R.C.P.*

J. Penn Milton[1] reports a case in which fifteen pints of chylous fluid were withdrawn from the left pleura at one sitting, a record amount. The report on the fluid read, "Yellowish, turbid, puriform fluid ; sp. gr. 1027 ; alkaline. Cells conspicuous by their absence ; no tubercle bacilli ; a few cocci. The fluid contains a large amount of fat and also of coagulable albumin ; it is therefore like the fluid met

with in cases of chylothorax." There was no recurrence of the effusion, the patient made a good recovery, and the lung expanded completely. The case was one of pulmonary tuberculosis, as in Fowler's case, and the chylous effusion pointed to a tuberculous lesion in the thoracic duct. Compensation by anastomosis through the right lymphatic duct is suggested as explaining the non-recurrence of the effusion.

REFERENCE.—*Brit. Med. Jour.* Nov. 1907.

CIRRHOSIS OF LIVER.

(*Vol.* 1902, p. 195.)—Cheadle, in the Lumleian Lectures, advised early and repeated **Tapping**. Diet is to be limited to simple proteids, toasted bread, green vegetables, and fresh fruit; alcohol, spices, and fats are to be forbidden. Purgatives must be mild, never drastic. **Mercury** and **Iodides** are indicated where there is a suspicion of syphilis, and **Digitalis** is useful for cardiac dilatation and dropsy.

COLON, SURGICAL DISEASES OF. *Rutherford Morison, F.R.C.S.*

The Operative Treatment of Chronic Constipation.—W. Arbuthnot Lane concludes that chronic constipation, which he says is the cause of very serious symptoms and occasionally death, should frequently be treated by operation, and that the operation best for the majority of cases consists in excision of the whole colon and anastomosis of the cut end of the ileum with the rectum. Though this operation has been followed by brilliant results in some of the recorded cases, it would appear that surgeons are waiting:—(1) For further evidence that the pathological conditions described by Mr. Lane do result from chronic constipation, and (2) For proof that remote results of the operation continue to be satisfactory. For chronic constipation so obstinate as to require surgical interference, it is probable that most surgeons would prefer to try the operation of appendicostomy suggested and successfully carried out by Keetley, bringing the appendix through a small opening in the right iliac fossa, cutting off its end, and using the appendix as a tube for irrigation of the colon. The risk of this operation is small, and the probabilities of success are large enough to deserve further consideration.

W. Arbuthnot Lane[1] says that by the term "chronic constipation" he includes mucous, membranous, and ulcerative colitis. In the earliest cases he removed the large bowel on account of pain in the cæcum, splenic flexure, or sigmoid. It was then found that the symptoms of auto-intoxication from intestinal stasis disappeared. At first the large bowel was removed as far as the splenic flexure, and the descending colon and sigmoid were left, it being thought, as these structures were vertically placed, faecal matter would not accumulate in them. It was afterwards found that these cases suffered from distention of the remaining portion of large bowel with gas, so the entire large bowel with the exception of the rectum was removed. Constant and prolonged vomiting occurred after these operations, which symptoms were controlled by subcutaneous saline infusions. The writer appends notes on thirty-nine cases, thirty of whom are described as well or improved, while eight died, and one developed an abscess, for which she is still under treatment.

Acute Flexures or Angulations of the Sigmoid.—James Tuttle[2] says these flexures may be congenital or acquired. The congenital form is due to the turning of the rectum to the left at its upper end, and thus bringing the two fixed ends of the sigmoid in such close apposition that the long loop between is necessarily acutely flexed. Sigmoiditis and perisigmoiditis are the chief causes of acquired angulation. Ulcers of the sigmoid may cause angulation by their cicatricial contraction, or by inflammation extending to the peritoneum and causing fixation of the gut at some abnormal point. The symptoms produced are constipation and fæcal stasis, and in the congenital type auto-intoxication due to absorption of the products of the retained fæces.

Treatment is both palliative and radical. In acquired cases relief is obtained by the passage of long rectal bougies through the flexure and leaving them inserted for a while. The bougie ought never to be inserted without the sigmoidoscope. Operative measures consist in straightening out the flexures, covering the raw surfaces, and if necessary, fixing the bowel so that it cannot resume its old position.

Torsion of the Appendices Epiploicæ.—Wallace A. Briggs[3] says that although the anatomical nature of the appendices epiploicæ has been thoroughly discussed, and loose bodies, or corpora aliena, in the abdominal cavity or in hernial sacs, resulting from torsion of their pedicles, have been reported at autopsy in a number of instances, until quite recently very little was known of their pathology. In lectures on pathological anatomy by Wilks and Moxon in 1889, the pathological importance of the appendices epiploicæ is discussed. In 1905 Riedel reported eight cases of torsion of appendices epiploicæ. Lorenz reports a case of irreducible right labial hernia in a woman æt. 33: at operation there was found a narrow tense pseudo-ligament, about 6 cms. long, among the loops of intestine, inserted mesially to the neck of a hernial sac, and around which an appendix epiploica arising from the colon had become twisted and strangulated. Bruns shortly after this reported a case of irreducible left inguinal hernia in a woman who was suddenly seized with pain, and at operation a gangrenous appendix epiploica in the hernial sac was found. Muscatello reports two cases of hernial incarceration of appendices epiploicæ. Another case is reported by Kruger in which torsion of the appendix epiploica occurred in a hernial sac. The writer reports a case which came under his own observation :—

A male, æt. 35, with no previous history of abdominal trouble, was seized with severe pain in the right iliac fossa. When seen the region of the appendix was painful and tender, and at the operation several days later a dense tumour about 1½ in. in length and 1 in. in width was found, having the appearance of a hæmatoma with a peritoneal envelope. It was universally adherent, and was attached to the cæcum by a narrow, rugous, and twisted pedicle. The neighbouring glands were enlarged; the appendix, though seemingly normal, was removed. Recovery was uninterrupted. Careful examination showed the tumour to be an appendix epiploica.

The conclusions are :—(1) Torsions of appendices epiploicæ are more frequent than the literature would lead one to suppose; (2) Torsions

of appendices epiploicæ usually occur in persons more or less obese, during middle life and later; (3) Such torsions simulate appendicitis, cholecystitis, and various other abdominal diseases. Torsions in hernial sacs may cause all the local symptoms of an acute omental or intestinal, femoral or inguinal hernia; (4) Torsions of appendices epiploicæ may result in corpora aliena adiposa, in adhesions and bands, and their consequences; (5) Corpora aliena adiposa may become infected and cause general peritonitis; (6) In the present state of our knowledge anything more than a tentative diagnosis of torsion of appendices epiploicæ would be rarely possible; (7) Early operation is indicated in all cases.

Ulceration of the Colon.—The treatment by operation of chronic ulceration of the colon which has resisted medical measures promises well. The exact form of operation desirable probably varies with the localization of the lesion. A cæcostomy of course rests the whole colon and allows of efficient flushing, but the condition of the patient with an artificial anus and its irritating fluid discharges at the cæcum is a very pitiable one. In many cases the inflammation and ulceration are limited to the lower part of the sigmoid and the rectum, and this can be ascertained by the sigmoidoscope. In such instances full benefit follows opening the sigmoid colon and establishing an artificial anus in the left inguinal region, where the fæces are solid and the patient's trouble is reduced to a minimum. In all doubtful cases the whole colon should be explored through an abdominal incision, and the decision what to do should be reserved till this examination has allowed of a definite estimate of the pathological conditions present.

Amœbic Dysentery (Chronic).—John Milton Holt[1] says surgical treatment should be carried out in all cases where the amœbæ persist in the stools after one year's patient trial of irrigation by the rectum, and where the amœbic ulceration is higher up the intestine than the sigmoid flexure. The operation he advocates is appendicostomy. The appendix is brought out through a gridiron incision; it is freed from its mesentery, and its vessels spared. The appendix is not opened until forty-eight hours after the operation. Closing the appendicular sinus after amœbæ have disappeared from the stools need give no concern; it is a very simple matter; the trouble has been that the opening closes only too readily if the small rubber catheter is not kept in all the time. There need be no haste in permitting the opening to close, the author maintaining that it is a matter of but trifling inconvenience, requiring attention only about once a week, while having it in readiness for use gives us control over the entire mucous membrane of the lower bowel.

Chronic Colitis.—J. P. Lockhart Mummery[2] says mucous colitis and membranous colitis are usually considered as separate and distinct conditions, but there is little, if any, justification for this, and he thinks the difference is only one of degree and not one of kind. In some cases there are severe attacks of pain in the abdomen, of a violent, colicky character, and these attacks may be accompanied by nausea

and even vomiting; such attacks usually follow constipation, and are followed by more or less diarrhœa and the passage of large mucous casts of the bowel, and sometimes of blood and sand. Definite attacks such as this are not present in all cases, though exacerbations of the condition are always well marked. In his experience the disease is almost as common in men as in women.

Treatment.—The great aim is to find and if possible correct the cause. Chronic appendicitis, cancer of the colon, adhesions binding down the bowel, may all give rise to symptoms of mucous colitis. Out of thirty-six cases of chronic colitis recorded in the *Lancet*, June 15th, 1907, there were only six in which no local cause for the condition could be found. The medical treatment of mucous colitis has not hitherto been very satisfactory, and in a fairly large proportion of cases has either failed altogether or only resulted in temporary benefit. Medical treatment should be given a fair trial, but if unsuccessful, or if an obvious lesion which can only be cured by operation is found, surgical treatment should be resorted to. In cases where there is chronic inflammation of the mucous membrane and no removable local lesion, he advocates appendicostomy. Ileo-sigmoidostomy has been proved to be of little value in these cases. Colectomy and ileo-sigmoidostomy, even in the hands of Mr. Arbuthnot Lane, has a mortality of over 18 per cent. The treatment of follicular ulcerative colitis consists in local irrigation of the colon, at first with weak solutions of hydrogen peroxide, and then olive oil. The ulcers that can be reached with the sigmoidoscope can be touched with nitrate of silver or the galvano-cautery. In more severe cases, when appendicostomy has failed to control the diarrhœa, a right inguinal or lumbar colotomy is the proper treatment, this giving complete rest to the colon.

Chronic Dysentery (*Colitis Ulcer, Chronica*).—Steiner[6] thinks that the results achieved by abdominal surgery during the last ten years justify the operative treatment of otherwise hopeless cases of dysentery.

Case 1.—A female, 27, ill for nine years with diarrhœa alternating with constipation, with mucus, blood, pus, and Charcot's and Leyden's crystals in the stools, and much emaciation. A large cæcostomy was made, and the colon washed out from below with weak iodine or protargol solution daily till the wash-water came out clean from the cæcostomy opening. After seven and a half months of this treatment, the artificial anus was temporarily closed by tampons soaked in vaseline, which allowed the stools to pass through the colon. Five weeks later, having proved that the colon could bear the passage of motions with impunity, the artificial anus was closed by operation. Six years later the patient continues in good health.

Case 2.—Female, 30, after a normal pregnancy developed diarrhœa with blood, slime, pus, and Charcot and Leyden crystals in the motions. Nine months later, after the formation of a cæcal anus, daily washing out with weak iodine or protargol, at the body temperature, was carried out. Two months later the artificial opening was closed after testing the propriety of this by tamponade of the cæcal fistula. The patient quickly gained 40 lb. in weight, and was restored to good health.

In such cases it is best to make the opening in the cæcum, because the transverse and ascending colon have been found ulcerated, and

an opening in the sigmoid flexure could not have helped this. Appendicostomy does not allow both of the healing factors of cæcostomy, because although it permits of flushing out it does not prevent the passage of stools over the diseased surfaces. An ileosigmoidostomy, though it prevents the passage of faces into the colon, is not desirable, because it is necessary as well to have a cæcostomy opening to remove the secretions of the diseased surface. In one patient who had had this done, the wash-water went into the ileum and caused bad colic; it also did not succeed in removing the colon contents. In these severe cases, and in other colon diseases, cæcostomy, then flushing and temporary closure of the cæcal opening, as a test before permanently closing the artificial anus, is to be strongly recommended.

"*Diverticula*" (*Sacculitis?*) *of the Colon.*—"Diverticula" of the colon, especially of the sigmoid, have been long known to pathologists. Only recently has their surgical importance been recognized, and chiefly as a cause of left-sided intra-abdominal suppuration or as "tumours" of the sigmoid which have been mistaken for cancer. More obscurity than probably belongs to the subject has arisen from the use of the term diverticulum as applied to these protrusions from the bowel, and small consideration shows that between them and the recognized diverticula there are many points of difference. It seems probable that all diverticula are of congenital origin. *All* coats of the intestine enter into their composition. All have a special vascular supply of their own. They are seldom if ever multiple, and are found at any age. The vermiform appendix is representative of this type in the normal subject. Meckel's diverticulum, due to arrested involution of the omphalomesenteric duct, has long been recognized as of surgical importance, and the existence of diverticula at different portions of the gastro-intestinal tract associated with small pancreatic outgrowths has been recently added to our knowledge of these interesting conditions. Of the traction diverticula due to the drag of a limited adhesion, nothing more needs to be said than that they ought to be classed separately from any other form.

The swellings observed on the colon do not answer to our description of a diverticulum at all; indeed, their origin is so different that the confusion caused by calling them diverticula should cease. They differ from diverticula in that they are never of congenital origin, and have consequently not been found in youth; are multiple; thin-walled, because the muscular coat of the intestine is usually absent in them; they are rounded in shape, do not attain to large size, and are practically limited to advanced life. In the urinary bladder, other parts of the gastro-intestinal tract, the gall-bladder, the vermiform appendix, and Fallopian tubes, similar swellings have been described: indeed, it is safe to say that they will be found if sought for in any of the hollow muscular-coated viscera. The cause in all is obscure, but in the colon as elsewhere, it is probable that chronic obstruction to the escape of the contents (constipation) and weakening of the wall are the determining factors. The suggestion that they are due to

traction from little masses of fat must be received with caution, for it is a curious fact that many pathological conditions of the colon—even cancer and tubercle—are associated with localized deposits of fat in the bowel wall. In the urinary bladder, where they have been known longest, they have always been called sacculi, and this would appear to be the most suitable name for them elsewhere. In their pathology, however, they closely resemble the diverticula of which the vermiform appendix may be taken as a type. Like this, they may harbour fæcal concretions, and inflammation in them leads to the same results. It is therefore possible to find, as a consequence of sacculitis of the sigmoid, gangrenous perforation with peritonitis, ulceration, and perforation with left iliac abscess, or inflammatory thickening and fibrosis closely resembling a malignant growth of the affected bowel.

Writing on the etiology of certain cases of left-sided intra-abdominal suppuration—acute diverticulitis—G. E. Brewer[7] says that during the last ten years he has observed six cases of acute intra-abdominal abscesses in elderly people, all originating in the left lower quadrant and presenting symptoms similar to acute appendicitis with transposition of viscera. In the first four cases the relationship between diverticulitis and abscess was not proved; still the similarity in symptoms between them and the last two cases is so striking as to lead to the belief that they might well have had a similar origin. In the last two cases the relationship between acute perforative diverticulitis of the sigmoid and a localized intra-abdominal abscess in the one and a spreading peritonitis in the other was definitely proved. In the first case, after washing out the abscess cavity, which contained a fæcal concretion, a small ulceration was seen in the wall of the sigmoid, through which fæcal matter escaped. In the other case, which at first suggested appendicitis with spreading peritonitis, a deeply congested loop of sigmoid was found, on the free border of which were the gangrenous remains of a small perforated diverticulum with a fæcal concretion the size of a date stone. The most frequently observed type of the congenital variety is the one known as Meckel's diverticulum. The acquired diverticula are as a rule multiple, small, thin-walled, and rounded or ovoid in shape; they may be found in any part of the intestinal canal, but are more frequent in the left colon and rectum, and are in reality hernial protrusions of the mucous membrane through the separated fibres of the muscular coat.

Loomis[8] in 1877 describes a case of peritonitis due to inflammation of multiple diverticula of the left colon, several of which contained concretions. Geo. Biggs[9] reported a specimen showing multiple diverticula of the sigmoid, one of which had perforated and caused an extraperitoneal abscess.

Malignant Disease.—The excellent results from excision of the colon for malignant disease reported by Charters Symonds, offer encouragement to surgeons in the attempt to deal radically with these growths. It is certain that many of them grow very

slowly, are possessed of a low degree of malignancy, and excision is followed by satisfactory results. It must not, however, be forgotten that exceptionally these growths are possessed of a high degree of malignancy, and that a radical operation is followed by rapid and widespread recurrence. The probability that intestinal obstruction in elderly people is due to a malignant growth of the colon should never be lost sight of. In the face of obstruction only a drainage operation (cæcostomy) not resection—should be performed. The radical operation must be postponed till the colon has emptied itself and been emptied of its septic contents. Jamieson and Dobson have carefully worked out the lymphatic area involved in cæcal cancer, and the operation they suggest, and have successfully performed, is a great advance on the older methods, because it not only allows of removal of the growth, an operation which can only be regarded as palliative, but of the whole lymphatic area likely to be invaded by cancer cells. The information of to-day concerning the radical cure of cancer here as elsewhere is, that removal of the growth and of the whole of the lymphatic area connected with it is necessary: hence the importance of this work.

Charters Symonds[10] says the two main signs of malignant disease of the cæcum are the presence of tumour and the occurrence of early intestinal colic due to obstruction of the iliocæcal orifice. The growth presents a movable, hard, well-defined tumour, so close to the abdominal wall that it may be grasped by the hand and even lifted from the posterior wall. From a position of rest the tumour can be moved downwards towards the middle line; upwards it may be moved as far as the ribs, making a vertical course and not passing into the loin, the range of movement varying with the mobility of the cæcum in each individual. The discovery of a tumour by the patient may be the first evidence of the disease. When the growth begins in the lips of the iliocæcal valve, colic is an early symptom.

Diagnosis.—The swellings in the region of the cæcum to be diagnosed from malignant disease are: (1) Because most common, the conditions resulting from appendicitis. When cancer attacks the posterior wall of the cæcum, perforation occurs early, with fixation and suppuration; it then closely resembles subacute appendicitis. (2) Glands in this region in the angle between the ileum and cæcum may form definite tumours.

Another condition is tuberculosis of the cæcum. The resemblance of these two conditions was fully illustrated in a paper by Professor Hartmann on iliocæcal tuberculosis. Both conditions require removal, so that error is of less moment except so far as regards the extirpation of lymphatic infection. Actinomyces in the later stages, when infiltration and suppuration occur, resembles malignant disease beginning in the posterior wall and attended by suppuration.

Limits of Operation.—So mobile is the growth, even in some advanced cases, that until the abdomen is opened one cannot be certain whether extirpation is possible or not. The presence of ascites and

of secondary deposits in the peritoneum or liver puts excision out of the question. Adhesions to the posterior wall, with infiltration of the muscle or with a sinus, also makes removal impossible. Infiltration of the anterior abdominal wall, unless very limited, must also render complete eradication impossible. Involvement of the neighbouring coils of intestine is not as a rule a bar to excision, for there need be no general peritoneal infection.

Palliative Treatment.—Short-circuiting by anastomosing the ileum to the transverse colon when the disease is too extensive for removal. For making a junction between the end of the small intestine and the side of the large in the absence of septic contents, he prefers the Murphy button to direct suture. He never makes use of the button without supplementing it by a row of Lembert's sutures all round, and where possible enfolding the junction by the great omentum.

Jamieson and Dobson[11] record two cases of excision of the cæcum and ascending colon with the corresponding lymphatic area. One case was a carcinoma of the ascending colon, the other tuberculosis of the cæcum. The contribution proves clinically their description of the lymphatic distribution of the excised area in the *Lancet* of April 27th, 1907. They make a great point of the lymphatic gland lying on the duodenum at the origin of the ileocolic artery; this gland was infected in each case. Their operation consists of the removal in one piece of the terminal portion of the ileum, the cæcum, the ascending colon, the hepatic flexure, and the whole chain of ileocolic lymphatic glands up to the origin of the ileocolic artery.

Answering the question, "What shall we do with far-advanced cancer of the large bowel?" R. C. Coffey[12] reports on nine cases, from June, 1900, to June, 1907, of which he operated on eight. Two died within six days of the operation, one as the result of stercoræmia and the other of pulmonary embolism. One died of starvation four weeks later; one three months after the first operation from toxæmia. The remaining four cases when last heard of were doing well. He quotes Willy Mayer's eleven cases of cancer of the large bowel with six deaths and five recoveries. Jonas reports sixteen cases, and shows that in operation while the patient is in good enough condition to withstand immediate anastomosis and removal, the mortality should not be greater than in other intestinal surgery. Hartwell analyzes forty-six cases of cancer of the rectum, the mortality from operation being 26 per cent. Tuttle's mortality for cancer of the rectum is 16 per cent. Kelsey's mortality has recently been as low as 3 per cent in the lower segment of the rectum, and 26 per cent when it is necessary to open the peritoneal cavity. The Mayo brothers have in the past five years operated upon twenty-six patients for high rectal cancer by the combined abdominal-perineal route. Of these, seven died as the result of operation within the first month. Of the nineteen who recovered, two were not traced, but were known to be alive and well more than one year after the operation. Ten patients operated

upon too recently to be of value in statistics are alive and well now. One operated upon a year ago died before the end of the year. Seven lived over one year, five are now alive. Five lived over two years; three are now alive. Three lived over three years; two are now alive. Four only were operated on more than three years ago; two are alive and well. This makes 50 per cent alive and well over three years.

Paul Cavaillon and Emile Perrin,[13] discussing colectomy in cancers of the large intestine, state that the operative treatment in left cancers is entirely different from that of right; that in left cancer the operation for its removal must be carried out in stages, and not performed all at one operation. The most important reason for this is the unsatisfactory condition of the bowel above left cancers. It is œdematous, hard, rigid, friable, and tears easily with suture. Death from peritonitis follows the suture of such intestine. From different surgical sources they state the mortality for removal of left cancers in one operation is 44 per cent, while the statistics of nine surgeons show a mortality of 26 per cent from colectomy in several operations, and Cavaillon alone has a mortality of 18 per cent of cases done by this method.

They state that there are various methods of performing colectomy in several operations, and the one they prefer is by the three operations: (1) Performing a cæcostomy, (2) removal of the growth, (3) closure of the cæcum. They report nine cases operated upon by the three-operation method, with seven cures and an operation mortality of 22 per cent. They state that in performing the cæcostomy the tumour should be explored at the same time with the idea of learning its mobility, etc. The cæcostomy opening should be small (the bowel opening). In removal of the growth they prefer an incision on the left side if the growth permits, and if necessary the longitudinal lateral incision is joined by a transverse one, forming a T- or L-shaped incision. Of the anastomoses they prefer a lateral-to-lateral after closure of the bowel ends. They call every cancer a right cancer whose removal leads to an ileocolostomy. Left cancers are all cancers the removal of which leads to a colo-colo anastomosis.

A new method of restoring the continuity of the bowel in cases of excision of a growth low down in the sigmoid flexure is described by J. P. Lockhart Mummery.[11] He points out that in cases where a portion of the sigmoid flexure has been removed, it is extremely difficult to deal with the ends, as the lower stump of bowel or upper end of the rectum is situated so deep in the pelvis that any ordinary form of end-to-end anastomosis is out of the question. After the removal of the growth a Keith's tube is tied into the upper end of the sigmoid flexure, and the free end is passed into the rectum and drawn out of the anus. By drawing on the Keith's tube the upper end of the sigmoid flexure is invaginated into the rectum, so as to form a kind of intussusception. Several silk sutures are put in to prevent the invagination from coming undone.

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CONJUNCTIVA, DISEASES OF.

John Yearsley, B.A., M.R.C.P., F.R.C.S.

Trachoma.—The onset of this disease is sometimes so insidious that an early diagnosis is not made. Even the acute stage itself, accompanied by a mucopurulent discharge, may strongly resemble other forms of conjunctivitis, so that the granulations and tendency to pannus may only be detected when the inflammation has subsided. Once diagnosed, the indications are clear. For the discharge Ormond[1] recommends that the mucous membrane of the lids and fornices, after washing out with weak perchloride of mercury lotion, should be brushed three or four times a day with a solution of **Silver Nitrate** (1 or 2 gr. to 1 oz. of distilled water), and the excess removed with normal saline. For pain **Dionine Drops** (1 per cent) are valuable, and if the cornea is ulcerated and iritis threatens, solid dionine may be incorporated with atropine and yellow oxide of mercury in the form of an ointment to replace the nitrate solution. If the cornea and iris are not implicated, the granulations may now be treated with a stronger preparation of the nitrate (2 per cent) once or twice a day, followed by the saline lotion. When the eye is fairly quiet, the trachoma bodies can be expressed with roller forceps after the instillation of cocaine, and a strong solution of corrosive sublimate (1–500) can be rubbed in. A general anæsthetic is necessary in some cases, and the resulting inflammation is best treated by ice poultices intermittently applied during the next twenty-four or forty-eight hours. At the end of ten days "blue-stone" treatment is instituted, and the chronic stage may be said to have arrived. In this stage exacerbations are not uncommon, and Ormond regards them as due to a secondary infection. A slight pannus disappears as the granulations are absorbed, but if pronounced he performs peritomy. Yellow ointment and dionine drops aid in clearing up opacities in the cornea. Smoked glasses relieve the photophobia.

For cicatricial entropion, Snellen's operation is recommended. The author concludes an instructive paper by deprecating heroic measures, insisting on careful hygiene, and pointing out the necessity (sometimes ignored) of continuing the treatment even after an apparently complete cure.

Egbert[2] has designed a sharp and a blunt curette for the treatment of trachoma. The former is employed to scrape away hyperplastic tissue, and the latter is next rubbed firmly over the rawed area to stimulate absorption. During the operation the eye is irrigated with boric lotion, and iced compresses are subsequently applied. The after-treatment consists of massage with a glass spatula. Scellingo[3] reports favourably on the use of a 2 per cent ointment of **Picric Acid** in the treatment of trachoma, and thinks that it can be employed

with advantage in other forms of conjunctivitis. Prince[4] cauterizes shallow ulcers of the cornea, but performs a Saemisch's section if Descemet's membrane is exposed and if hypopyon is present. The incision is daily opened up with a probe, and the anterior chamber and (with it) the hypopyon evacuated, till the cornea shows signs of recovery. For the treatment of thick, intractable pannus (*crassus*), Goldzieher[5] has revived **Gonorrhœal Inoculation**, first employed by Jäger. In one remarkable case not only was the pannus cured, but the trachoma bodies entirely disappeared.

For excessive secretion in trachoma, Veasey[6] prefers frequent instillations of 25 per cent **Argyrol**, following irrigation with normal saline. He discards the silver solution when it becomes black, and recommends the employment of fresh preparations only. Like Ormond, he emphasizes the folly of stopping treatment when the symptoms have disappeared, and in the chronic stage employs sulphate of copper solutions, 10 to 40 gr. to the ounce, as a single daily application, and ½ per cent as "drops."

Angular Conjunctivitis.—The signs of inflammation are slight, the ocular conjunctiva being little if at all affected. In a well-marked case, the inner and outer angles are raw and sodden, and the lid margins red. There is an uncomfortable feeling of grittiness, and the patient is tempted to rub the eyes. The glueing of the lids to the eyeball is a common feature. Under the microscope, the scanty secretion is seen to contain the diplobacillus of Morax-Axenfeld, characterized by its square, well defined outline.

Leslie Paton[7] recommends **Zinc Sulphate Lotion** (1 or 2 gr. to 1 oz. of distilled water) agrees with that of others who regard it as a specific in this disease. He advises that the patient should be warned to expect some smarting on its application. Vaseline should be smeared on the lid margins at night to prevent sticking. Muir Kelly[8] is in favour of employing a stronger solution of the sulphate (4 or even 8 gr. to the oz.), and finds that pain is seldom complained of and that cases are cured in about a fortnight. The correction of errors of refraction is held by Cunningham[9] to be a material part of the treatment. When, as sometimes happens, angular conjunctivitis has an acute onset, a correct diagnosis can only be made with the aid of the microscope.[10] If the diplobacillus is found, time need not be wasted by using preparations which do no good.

Catarrhal or Mucopurulent Conjunctivitis.—The commonest cause is the minute bacillus of Koch-Weeks, but the pneumococcus is responsible for a certain number of cases. This form of conjunctivitis is often called "pink eye" from the appearance of the ocular conjunctiva. The diagnosis usually presents no difficulty, but there is no clinical distinction between cases due to the Koch-Weeks bacillus and those excited by Fränkel's organism. Paton[11] is of opinion that the pneumococcic form tends to clear up earlier than the other. The treatment commonly adopted is frequent flushing with **Boric** or **Saline**

Lotion, and the daily application of 2 per cent **Silver Nitrate** to the everted lids, the excess being neutralized with the salt solution.

Cunningham[12] favours Darier's *savonnage* with **Argyrol** once a day, with the home use of boric lotion and boric ointment. Silver nitrate solution he reserves for the more obstinate cases. A streptococcic infection, of a catarrhal type, sometimes occurs, accompanied as a rule by membrane formation (*see* MEMBRANOUS CONJUNCTIVITIS) and rapid involvement of the cornea. Both the Koch-Weeks and the pneumococcus may also produce a solid exudate. Corneal ulcers call for the instillation of atropine.

Membranous Conjunctivitis.—We now know that the Klebs-Löffler bacillus is not the only organism capable of producing this type of conjunctival inflammation. The distinction is shared with several other bacteria, among them the *Staphylococcus pyogenes*, the pneumococcus, the streptococcus, the gonococcus, and the bacillus of Koch-Weeks. Arnold Lawson[13] gives an account of two cases in children, whose sight was lost owing to perforation and complete opacification of the corneæ. The *Streptococcus pyogenes* (accompanied in one case by the *Staphylococcus pyogenes aureus*) was present. The disease commenced with a brawny infiltration of the lids and a slight watery discharge. The medical attendant in each case did not realize the danger until the discharge was frankly purulent and abundant. When Lawson first saw the cases the damage to the cornea was irreparable. He emphasizes the rapidity with which a disintegrating keratitis takes place in many of these cases. In the examples quoted the membrane covered both the palpebral and ocular conjunctiva, and seriously hampered the nutrition of the cornea. When the sloughs had separated, troublesome adhesions formed. Quinine lotion (1 per cent) was used every hour to wash out the eyes, atropine was instilled twice daily, and antistreptococcic serum was employed, too late, however, to save the sight.

Fromaget[14] treated two cases of membranous conjunctivitis with subcutaneous injections of **Antidiphtheritic Serum.** Bacteriological investigation pointed to the pneumococcus as the cause, associated in one case with the staphylococcus. The results were excellent, and he recommends this treatment in "membranous" cases where the cause is doubtful and delay dangerous. The benefit which some have reported after the injection of antitetanic serum in these serious inflammations of the eye, coupled with his own experience related above, inclines Fromaget to suspect that simple (*non-immunisé*) horse-serum would be as effective.

Parinaud's Conjunctivitis.—Only a few examples have been reported. The salient features are nodules on the palpebral conjunctiva, and enlargement of the pre-auricular and cervical glands. One eye only is affected, and the adenopathy is confined to the same side. Arthur Sinclair and Shennan[15] have very fully described a case which they had under observation for over a year, which we illustrate in *Plate IX* by permission of the Ophthalmological Society. The glands suppurated,

and there were erosions of the epithelium covering the nodules. The glands were opened, and some of the nodules removed on several occasions. In twelve months the disease had left no trace, other than the scars after incision of the glands. The *Staphylococcus epidermidis albus* and another staphylococcus were separated from the erosions and from the suppurating glands. Experimental inoculation was not very conclusive. A vaccine was prepared and vaccino-therapy commenced, but this form of treatment was abandoned, as the patient failed to attend regularly. The paper, in which the pathology is exhaustively dealt with, concludes with the hope that future cases of the disease will be specially observed, so as to determine whether or not the conjunctival erosions and suppuration of the glands are related to one another as respectively cause and effect.

Spring Catarrh is rare in these islands. The tessellated papillæ on the palpebral conjunctiva and at the corneo-scleral junction are diagnostic. Sometimes the nodules are only present on one of these sites. The bluish-white film seen on everting the upper lid is the thickened epithelium. The growth may form a complete ring round the cornea, which, however, seldom suffers. The affection is chiefly found in boys, and is accompanied by itching and photophobia in warm weather. Harrison Butler,[16] who had much experience of the disease in Palestine, found that some cases bore a resemblance to trachoma, but could be distinguished by the hardness of the growths and the freedom of the cornea from pannus and ulcer. *Plate X*, taken from a photograph kindly lent by Dr. Butler, illustrates the growths on the inner surface of the upper lid. The cause is obscure, and treatment only palliative. Prominent growths may be snipped off, the contents of the rest expressed with roller forceps, and massage with yellow ointment practised. Improvement is sometimes wrought with adrenalin. The disease, after lasting for many years, may die away and leave no traces.

Herbert[17] regards the presence of eosinophile cells in the milk-like film, accompanied by a moderate eosinophilia in the blood, as diagnostic of this disease, despite Parsons'[18] suggestion that concurrent asthma or helminthiasis may not have been excluded.

Ophthalmia Neonatorum. Stephen Mayou[19] finds that in large lying-in institutions prophylactic treatment has become crystallized into wiping secretion from the lids, as soon as the head is born, with moist corrosive wool, and, immediately after birth, applying 1–2000 sublimate lotion or a drop of 2 per cent solution of silver nitrate to the conjunctival sac. If this treatment is carefully carried out, it is almost certain that no birth infection will take place. The discharge, which sometimes lasts for forty-eight hours after dropping in the nitrate, may be obviated by neutralizing with saline lotion when the nitrate has had a few moments to act. The sublimate is followed by next to no reaction; on this account, and because the silver often becomes deposited in the bottle (thus rendering the nitrate inert), many practitioners employ only the mercurial solution.

PLATE IX.

PARINAUD'S CONJUNCTIVITIS*

* Dr. Arthur Sinclair and Dr. Theodore Shennan's Case.

SPRING CATARRH

Exceptionally, these prophylactic measures do not prevent ophthalmia, even when a post-partum infection has been carefully excluded. As regards the treatment of the eye, once infection has taken place, Mayou brushes over the everted lids and fornices once a day with 2 per cent silver nitrate solution, and neutralizes with normal saline. In addition, the conjunctival sac is washed out with 1–8000 corrosive lotion every hour. A careful watch should be kept on the cornea, and as soon as a haze appears, atropine must be instilled. If only one eye is affected, every precaution ought to be taken to prevent inoculation of its fellow. A bandage or Buller's mask may be applied, but should not be allowed to give a false sense of security, and assiduous treatment of the inflamed eye ought to reduce the risks of contamination to a minimum. If a cover *is* used, Mayou advises that the inner side of it should be sealed down with flexible collodion. When the discharge has ceased, irrigation should still be continued at gradually lengthening intervals for a month.

Schanz[20] protests against Greeff's dictum that an ophthalmia of the new-born, if taken in time, never leaves any trace behind it. He has from time to time met with cases in which the gonococcic infection was so virulent that much damage has been done to the cornea in spite of every care. The same author counters Greeff's view that a blenorrhœa, not due to the gonococcus, will do no harm and requires nothing more than an occasional wash out. Schanz calls to mind cases in which, though the gonococcus could be excluded, the cornea has not escaped.

About 70 per cent of the ophthalmias in the new-born are due to the gonococcus, but, among these, the virulence of the infection varies within fairly wide limits. Of the remaining 30 per cent caused by other organisms, Sydney Stephenson[21] holds that Fränkel's pneumococcus is responsible for about one-third, and is usually benign. McKee[22] ascribes some cases to the *Micrococcus catarrhalis* and the *Bacillus coli*, and a mild ophthalmia may be caused by the streptococcus, according to Parsons.[23] It seems, therefore, that the gonococcus, both from the frequency with which it causes inflammation, and from the potency with which it and its toxins are commonly charged, is the greatest foe to the infantile cornea. Still, even if the gonococcus is not present, it is wise to follow Schanz's advice, and use every care to prevent corneal complications.

By some the colloidal preparations of silver are used both in the prophylactic and in the curative treatment of ophthalmia neonatorum. Muir Kelly[24] discards silver in all forms, and prefers frequent irrigation of the conjunctival sac with two pints of **Normal Saline** at a pressure of one foot of water.

Ramsden[25] reports the cure of a case of ophthalmia neonatorum in two days by means of **Zinc Ionization.** Only two applications were made. **Ox Serum** has recently been used by Gilbert,[26] of Munich, with gratifying results.

Phlyctenular Conjunctivitis.—This disease, so common in children,

usually yields to massage with the **Yellow Oxide of Mercury** ointment. Sometimes the B.P. preparation is found to be too irritating, and can with advantage be reduced to half strength. The phlyctenules may crop up repeatedly, and necessitate prolonged treatment. Pain is not a prominent feature unless the corneal edge is implicated. When present, especially if there is a tendency to ulceration, atropine should be incorporated with the ointment. Refractive errors should be corrected, and the glasses tinted to relieve the photophobia. Corroborative treatment is usually called for, and carious teeth should be extracted; indeed, it is probable that the teeth have a good deal to do with the causation of this form (and other forms) of eye disease. In this connection Harman's[27] views are interesting. He finds that a phlyctenule is not caused by microbes, and only becomes infected when there is a breach in its surface. Once this has occurred, the *Staphylococcus pyogenes albus* and *aureus*, which are almost constantly present on the cilia, even in health, find access and produce ulceration. The ulcer does not extend indefinitely, but soon begins to cicatrize. The ball may be kept rolling by other phlyctenules which pass through similar stages. If a microbic origin for the phlyctenule is thus excluded, we must fall back upon some other explanation. Harman, having noted that the lower temporal quadrant of the conjunctiva was the commonest seat of phlyctenules, looked about for a cause for this predilection, and, as he thinks, found it in the nerve distribution to the area. The supply is afforded by a loop uniting the lacrymal branch of the first division with the malar branch of the second division of the fifth cranial trunk. He therefore regards the phlyctenule as a peripheral trophic lesion of herpetic nature set up by irritation either of the loop of supply or of various terminals in the distribution of the fifth. But why should the peculiarity of the nerve distribution to the lower temporal quadrant determine the greater incidence of phlyctenules in this situation? Harman thinks the answer lies in the probability that the influence exercised by a loop derived from distinct divisions of the same nerve is less stable than when the supply comes from a single source. If this is so, slight mechanical injuries which would have no trophic result in other quadrants might produce an herpetic lesion in this area. (It is worth noting that in rubbing the outer corner of the eye the finger more readily comes in contact with the lower than with the upper quadrant.) Direct injury to the conjunctiva is, however, not necessary, and an irritative focus elsewhere in the course of the fifth nerve can reflexly excite herpes in this *locus minoris resistentiæ*. If, again, we allow the possibility of reflex irritative phenomena, the twofold source of nerve control favours the more frequent development of phlyctenules in this than in any other region of the ocular conjunctiva.

Mackay[28] describes a case of recurrent phlyctenular conjunctivitis (*see Plate XI., Fig. 1*) with a tendency to attack the cornea, in which the correction of a high degree of hypermetropic astigmatism, coupled with local and constitutional treatment, seems to have checked the

PLATE XI

PHLYCTENULAR KERATITIS.

(Dr. Geo. Mackay's case treated by Staphylococcal Injections.)

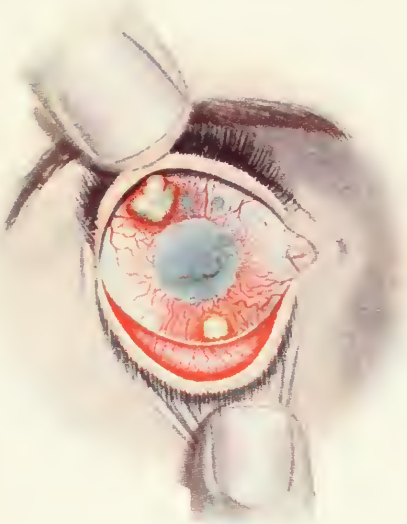

Fig. A. —Before treatment.

Fig. A1.—Five days after the first staphylococcal injection.

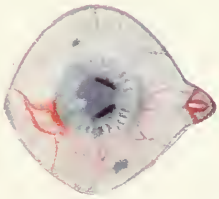

Fig. A2.—The same case in April, 1908. A small phlyctenular ulcer is present about the 8 o'clock meridian of the cornea.

TUBERCULOUS IRITIS.

(Clarke and Mayou.)

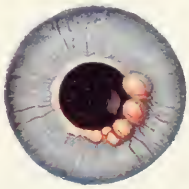

Fig. B.—Case of Confluent or Conglomerate Tubercle of the Iris, treated by Tuberculin. (*See* IRITIS.)

disease for three years. It then reappeared in the same eye—the right—and for six years continued to give trouble from time to time. Every quadrant of the conjunctiva was affected at some time or other. A peculiarity of the case was that though there was evidence of old disease in the left eye when Mackay first saw the patient, this eye gave no subsequent trouble. The age, too, was somewhat unusual, for, though the disease had commenced in early girlhood, it continued till she was nearly thirty. Latterly, the case suggested tubercle, but though the index was a little below normal, the early and marked positive phase was regarded as strong evidence against the presence of Koch's bacillus. On the other hand, the phagocytic index for *Staphylococcus aureus* was high, followed the day after an injection of $\frac{1}{300}$ mgram of dried coccus by a marked negative phase. Injections of the same organism were made from time to time, the index being taken as a guide. Improvement was soon noted, and the eye cleared up in a remarkable way. The case was still under treatment when the paper was read. Mackay points out that one of the drawbacks to this form of treatment is the necessity of giving injections over a long period, as no permanent immunity seems to be established by them.

If Harman's theory of the causation of phlyctenules is correct, it is not likely that the vaccine will prevent their formation; still, if it can control the disintegrating processes which result from infective ulceration, it deserves to be regarded as a valuable *dernier ressort*.

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CONSTIPATION IN CHILDREN.

(*Vol.* 1890, p. 206; *Vol.* 1892, p. 153; *Vol.* 1895, p. 177)—**Enemata of Glycerin** ℥ss to ℥j act quickly and harmlessly. **Abdominal Massage** sometimes suffices without aperients. In dieting, avoid starchy food; fruit is useful. If aperients are needed, a teaspoonful of the following syrup may be given before meals: Syrup of Rhubarb and Syrup of Gentian, of each ℥iv; or a morning teaspoonful of Syrupi Aurantii Flor., Ol. Ricini āā ℥vj; to be well shaken. In older children a morning teaspoonful of the following compound will suffice. Calcined Magnesia, Sulphur, Cream of Tartar, of each ℥vj; Oil of Anise, 15 drops.

CONVULSIONS, INFANTILE.

(*Vol.* 1892, p. 155; 1894, p. 172; 1895, p. 175)—There are many methods recommended: (1) In cases with cyanosis, give a few whiffs of **Amyl Nitrite**, followed by chloroform. Then inject **Tinct. Veratri Viridi** (half a minim for each year of age) under the skin. (2) Remove gastro-intestinal irritation by using emetics, laxatives, or anthelmintics, as the case requires. Put the child in a tepid bath with or without mustard, and apply cold douches to the head. For continuous convulsions give **Sodium Bromide** and **Chloral Hydrate** in equal parts. (3) Schumann says that **Abdominal Massage** will afford instant relief.

CORNEA, DISEASES OF. *Ernest E. Maddox, M.D., F.R.C.S.*

Keratitis.—Holmes Spicer[1] points out that sensation in the cornea is not complex like that of the skin, but is a pain reaction only; all harmful stimulation of the cornea, whether by touch or drying, or from excessive light, gives rise to sensations of pain only. Eyes with defective pain reflex are liable to ulcers. He confirms the usual treatment of relapsing *bullous keratitis*, viz., that of carefully removing all shreds of epithelium and securing rest by atropine and compresses. *Superficial punctate keratitis* is regarded by him as acute catarrh of the whole conjunctiva, which would be found to have its own organism, and in the relapsing variety, strong **Dionine** is recommended in addition to other treatment.

Band-shaped keratitis, otherwise called *zonular opacity*, or *calcareous film of the cornea*, is but rarely primary, and nearly always secondary to some degenerative changes in the eyeball. It generally commences at the inner and outer extremities of the horizontal meridian of the cornea, and spreads into a belt along this meridian. Calcium carbonate and phosphate have been found in parts removed. The treatment of this affection has hitherto been very unsatisfactory, but Heath, of Indianapolis, records a case greatly improved by accidental inoculation with trachoma which was promptly treated with strong solutions of silver nitrate by the surgeon, and by 1–4000 perchloride washes at home. This rather supports the view that it is due to the loss of vital energy in the cornea from vascular changes, and points to **Jequirity** as a possible mode of treatment. The other eye was scraped without effect, but had its vision greatly improved by iridectomy.

Corneal Opacities due to *lead* and *copper* are best removed with **Ammonium Chloride**, according to Guillery.[2] Silver stains are but imperfectly removed with **Sodium Thiosulphate.**

Hertel[3] has employed modified **Finsen Light** of such wave length as to avoid injury to the retina for the treatment of *Hypopyon Keratitis.* The eyes are exposed to the rays, generally from three to five minutes, and in many of the cases several sittings were required. The first effect is to cause an increase of infiltration of the ulcer and of the hypopyon. Its advantage is the diminution of scarring, as compared with the cautery. Nearly half the cases recorded resisted the treatment, the remainder being successful. This is not likely to become a very popular mode of treatment, the cautery, especially if combined with, paracentesis, being so eminently successful that no case need be despaired of which has not gone on to panophthalmitis. If the electro-cautery be employed properly, the opacity resulting is far less than might be expected.

Grey Edwards[4] has had good results from **Staphylococcic Vaccine** in three cases of hypopyon ulcer. He prefers its use to that of the subconjunctival injections which he favoured previously.

REFERENCES.—[1]*Brit. Med. Jour.* Nov. 2, 1907; [2]*Ophthalmoscope*, July, 1908, p. 546; [3]*Ophth. Rev.* Feb. 1908; [4]*Ophthalmoscope*, Feb. 1908, p. 70.

CRETINISM.

(*Vol.* 1895, p. 324)—**Thyroid Extract** may be given in 5-gr. doses either once or twice a day, according to the age and progress of the patient. If given thus, tabloids are convenient to administer. Others still uphold the greater value of raw sheep's thyroid glands or the fresh expressed juice mixed with water.

CYSTITIS.

Vaccine treatment is applicable to cystitis excited by *B. coli communis* or *B. tuberculosis*. Chronic mucopurulent cystitis should be treated by washing out the bladder with **Boric Lotion.** A drachm of **Iodoform Emulsion** may be poured into the bladder with the last few ounces of lotion and left there. A useful prescription for such cases is: Urotropini gr. x, Tinct. Hyoscyami ʒss, Inf. Buchu ad ʒj: three times daily.

DELIRIUM TREMENS. *Purves Stewart, M.D.*

To the thoughtful physician it is evident that delirium tremens cannot be dependent on the direct toxic action of alcohol, inasmuch as the symptoms are not produced by a bout of alcoholic intoxication, however acute, but supervene in chronic "soakers" who, after having consumed increasing daily doses of alcohol over a prolonged period, lasting many months, at last develop delirium tremens. A possible explanation has been offered by Jauregg,[1] who makes the suggestion that the toxic substance which induces delirium tremens is really an antibody generated by the alcohol—an anti-alcohol. The existence of such an antibody would serve to explain several points hitherto obscure, such, for example, as the fact that in a chronic alcoholic patient the amount of alcohol necessary to produce intoxication, or even alcoholic euphoria, has to be gradually increased as time elapses; further, it would explain the fact that delirium tremens is specially liable to supervene when alcohol is suddenly cut off or greatly restricted in amount. Such a theory, as Hare[2] has pointed out, would also explain the admitted tendency of delirium tremens, when treated without alcohol, to run a course of fairly definite duration and to end by the crisis of sleep. It would also account for the fact that the administration of alcohol modifies the severity of the delirium but prolongs its duration, and would afford an explanation why in chronic alcoholics there is a special tendency for delirium tremens to develop when there is sudden abstention from alcohol; it being precisely in such patients that the largest amount of anti-alcohol would have been formed in the body. Hare has directed attention to the frequency with which delirium tremens and epileptiform fits are observed to follow the sudden withdrawal of alcohol—for example, when the chronic alcoholic has an accident or acute illness which confines him to bed. Such cases cannot be attributed, as some have thought, to the shock of the accident, which is often a trivial one, since the epileptiform fits or delirium tremens do not appear immediately, but perhaps several days after the alcohol has been cut off.

The average death-rate of delirium tremens is put at widely varying figures by different authors. Thus, for example, L. N. Boston,[3] in a series of 156 cases treated at the Philadelphia General Hospital during a period of three years, gives a total mortality of 37·1

per cent, whilst Eichelberg,[1] giving the statistics of 1574 cases treated during eleven years at the Hamburg General Hospital, states the average mortality as only 2·4 per cent. He specially excludes, however, 173 cases of delirium tremens complicated with pneumonia, of which the average mortality was 33 per cent. Of the various complications, pneumonia is the most frequent, but the occurrence of pre-existing cardiac or renal disease makes the worst prognosis. All Boston's fifteen cases complicated with renal disease were fatal, and of thirteen with cardiac disease, eleven died. Such renal cases were instances of organic nephritis, not mere transient albuminuria, which Eichelberg states occurs in 40 per cent of all cases.

Treatment.—The best authorities agree as to the general advisability of immediate withdrawal of alcohol. The most important indications are to watch the strength of the heart, to stimulate it if necessary by digitalis, strophanthus, camphor, caffeine, etc.; secondly, to procure sleep, say by a mixture of chloral gr. 30 and potassium bromide gr. 20, repeated four-hourly if necessary. A **Hot Bath** or hot pack is often of great assistance in soothing a restless patient. In violent mania, the best sedative is **Hyoscine Hydrobromide** hypodermically. Thirdly, the bowels should be encouraged to act by jalap or other brisk aperient, and the kidneys should be flushed out by abundant diluent drinks. Food should be administered frequently—every two hours when awake—and in easily assimilable form. If pneumonia supervenes, **Digitalis** should be given, and it may be necessary to administer alcohol freely for a time.

References.—[1]Cutten's *Psychology of Alcoholism*, 1907, p. 258; [2]*Norwood Sanatorium Reports*, No. 10, July, 1908; [3]*Lancet*, Jan. 4, 1908; [4]*Münch. med. Woch.* May 14, 1907.

DERMOLYSIS. *E. Graham Little, M.D., F.R.C.P.*

This is an undescribed dissolution of the skin. Nodules from 3 to 10 mm. in diameter, of a cherry-red colour in early stages, round, dome-shaped, firm, and freely movable in the skin, were present on the elbows and suprapatellar region of a Russian baker, who described them as having persisted for twenty-five years. There were no subjective symptoms associated with the eruption. The older lesions were flat-topped, muddy-white, softish papules, arranged in a circle around a central blue and red relatively shrunken skin. When examined histologically the essential feature of the disease appeared to be a rarefaction of the corium from the subpapillary layer downwards, but the tissues—collagen and elastin—stained normally; peri- and end arteritis were present: polynuclear cells, mast cells, and plasma cells were absent: there were areas of perivascular perifollicular, and periglandular lymphocytic infiltration: the collagen was basophilic in parts, and collastin appeared, with final local disappearance of collagen and elastin. Charles White[1] finds no exact analogue, either clinically or histologically, for the condition, which remains apparently unique.

Reference.—[1]*Jour. Cutan. Dis.* July, 1908.

DIABETES. (*See also* OPSONIC INDEX IN DIABETES, p. 74.)

Prof. J. Rose Bradford, D.Sc., M.D.

In a discussion on diabetes in the tropics at the British Medical Association at Sheffield, 1908, attention was drawn to the frequency with which glycosuria and diabetes occur in the natives of India, and how the malady was essentially similar in the various types presented, to that seen in this country. There are, however, some differences, and one of the most striking is the fact that acute cases are not met with in the tropics with the frequency with which they are seen in this country, and thus it constantly happens that the diabetic is not emaciated and his appetite is less ravenous than in the European type. Further, as Sir Havelock Charles pointed out, the duration of the disease may be very considerable, lasting as long as twenty-five years, and according to him the progress of the malady is often more slow than in the European. In the Punjab the disease would seem to be rather rare, whereas in Bengal it is not only common, but according to Charles would seem to be becoming more common. The food of the Bengalee is one peculiarly rich in flour, pulses, and sugars, and many writers have thought that the disease might indirectly be associated with, and be dependent on, dyspepsia. Glycosuria would seem to be very frequent amongst the Bengalese, as the statement has been made that ten per cent of the well-to-do males suffer from glycosuria. The disease would seem to be more common among the upper classes and to be more common in men than in women. According to Dr. Bose, who has made an analysis of 325 cases, the disease is most prevalent between 40 and 50 years of age, and in very few instances did the symptoms appear before 30. He states that diabetes is most prevalent among the aristocracy of India, and that but few cases occur amongst the labouring and agricultural classes. He considers that two types, acute and chronic, may be seen, but that the acute is rare, and according to his experience, albuminuria is the most frequent complication, and much more so than phthisis, carbuncle, cellulitis, or gangrene.

DIABETIC COMA.

(*Vol.* 1893, p. 162)—Reynolds' method is simple: beginning with an aperient, he orders the patient to drink a gallon of fluid (milk, tea, lemonade, water, or barley-water) every night, with **Potassii Citrat.** ʒj in an ounce of water every hour. Stadelmann recommends intravenous injection of 150 cc. **Normal Saline** containing Sodium Carbonate 7·2 grams and Sodium Bicarbonate 4·6 grams.

DIAPHONOSCOPY. (*See* EYE, DIAGNOSTIC METHODS.)

DIARRHŒA, INFANTILE. *Prof. G. F. Still, M.D., F.R.C.P.*

So many classifications of infantile diarrhœa have been proposed, that observers may be excused if they solve this knotty problem by adopting a purely symptomatic grouping, as Lucas[1] does in his account of 136 cases which occurred on the Boston Floating Hospital. There were several distinct types: (1) The utterly hopeless cases, with severe toxæmia, presenting the picture of "coma vigil," with eyes

half open lustreless and with a proneness to develop corneal ulcers. (2) The toxic type, with or without frequent stools; very often the infants in this class had no movements without irrigations, or only one to three a day, yet they were certainly toxic. It was often noted that the toxicity lessened with the frequency of the stools thus showing that the number of movements is not always a good criterion from which to judge the severity of the disease. (3) Children between one and two years, active and in perpetual motion until completely overwhelmed with toxines, were very trying to treat. (4) The patients with frequent stools, that did not appear very sick or toxic, but often dragged on to become numbered with the obstinate chronic cases.

But such grouping, excellent enough for the clinician, does not satisfy the pathologist, who is still in search of some specific micro-organism as the cause of epidemic infantile diarrhœa. So many organisms have been confidently announced as *the* specific one, that one feels sceptical of any, and begins to wonder whether there may not be many micro-organisms capable of producing epidemics of infantile diarrhœa. One resembling the paratyphoid bacillus of the B group has been discovered by Williams, Rundle, and Williams.[2] Another observer believes the staphylococcus to be the chief cause; while others regard the streptococcus group of bacteria as more frequently causing diarrhœa. Some have thought that when diarrhœa is produced by streptococcal infection it presents certain symptoms of a characteristic kind. Schle,[3] for instance, says that streptococcal enteritis occurs mostly in hot weather, and produces severe toxic symptoms, which are often fatal through collapse. The streptococci are apt to infect the kidneys also, producing a nephritis which may cause œdema, but rarely causes uræmic symptoms. Often there is some pyelitis with it. Diffuse peritonitis may result from a streptococcal enteritis without gross lesion of the intestinal wall. The streptococci are to be found in the stools in large numbers, and are probably introduced in milk.

Once more the house fly is being blamed as the chief offender, by introducing bacteria into the infant's food, and also by alighting on the lips and mouth, and so infecting even breast-fed infants. Glover[4] thinks that the infant who sleeps with its mouth open is much more likely to contract diarrhœa than the one who sleeps with his mouth shut, for this reason; and he recommends that a fine meshed muslin should be kept over the infant's face during sleep. All food should also be kept covered with muslin to prevent access of flies; care should be taken that all vegetable and animal refuse from the house is burnt; and no open ashpits should be allowed. Fly-papers of the sticky variety should be at once used when flies appear; and if the pest becomes numerous a little turpentine should occasionally be poured over some dying cinders on a shovel. Powell also insists upon the necessity for cleanliness of the streets; and the immediate removal of soiled napkins from the room where an infant lives.

Treatment.—Powell recommends that where there is much fever

the skin should be moistened with lukewarm water slightly acidulated with **Vinegar** (a tablespoonful to two quarts), or the addition of double that amount of alcohol to two quarts of water may be used as an evaporating lotion. All food should be stopped for a time, which must be determined by the child's strength and general condition ; and then some cool water with a little brandy in it should be given, or whey may be used. The mouth should be frequently cleansed with **Glycothymoline** and **Listerine.**

Lucas (loc. cit.) uses **Stomach Washing** when there is vomiting with the diarrhœa, and repeats the washing as many as three or four times daily, just before feeding. **Irrigation of the Bowel** is of great value. Powell recommends common salt solution (1 oz. to the gallon) if there is much prostration, or a "mildly alkaline antiseptic solution if the stools are frequent and offensive."

Kimball[6] points out that irrigation, though indispensable in cases with much toxic affection, can be overdone, for it is always more or less exhausting ; he says the chief indication for irrigation is bloody stools and tenesmus. He advises large doses of aperients ; especially when the child is in a toxic condition, either stuporous or delirious. To an infant of eight months he gave ½ oz. of **Castor Oil** every eight hours ; from such heroic doses he has seen no harm, and his cases show that excellent results followed. To an infant a few days old he would give ⅛ to ⅙ gr. of **Calomel.** Either of these cathartics he thinks is specially valuable when there is much vomiting, for castor oil is so adhesive, and calomel is so heavy and insoluble, that neither is likely to be vomited entirely, and even if part is rejected the remainder will be sufficient to evacuate the bowels.

After the preliminary evacuation Powell (loc. cit.) says that **Copper Arsenite,** in doses of $\frac{1}{5000}$ to $\frac{1}{250}$ gr. given in solution every hour or two hours, will bring about a rapid improvement. Nuclein also, in doses of 2 to 10 drops of the solution given three or four times a day, is recommended. Powell also uses **Brucine,** $\frac{1}{2000}$ gr. every three or four hours, and, alternating with this during convalescence, he gives **Berberine Hydrochloride** $\frac{1}{67}$ gr., to improve the condition of the mucosa. Where there is much collapse he gives **Atropine Sulphate** $\frac{1}{800}$ gr. every hour until reaction occurs, when he discontinues its hypodermic use and gives it by mouth at longer intervals. He considers that in acute gastro-enteritis opium should never be given unless the bowels are cleared out, and only then if there be no cerebral symptoms or high temperature. If there is much fever he gives :—

℞ Amorphous Aconitine gr. $\frac{1}{134}$ | Strychnine Arsenate gr. $\frac{1}{251}$
Digitalin (Germanic) gr. $\frac{1}{67}$ | Aq. ℥iij
℥j to be taken every hour for a few doses.

When milk of any sort can be tolerated, the best form to begin with is the **Acidified Milk** which is prepared by adding lactic acid bacilli to fresh milk. He considers this suitable in spite of its richness in fat. As alternatives, he would give barley-water, then albumen-water, then whey and beef juice, or liquid peptonoids.

Gelatin is recommended by Péhu,[7] who gives an ounce or more of a 10 per cent solution of sterilized gelatin in the feeds: not less than ½ oz. must be given in the twenty-four hours. It is of value for affections of the upper part of the alimentary tract, gastro-enteritis, and also for the diarrhœa due to affections chiefly of the colon with dysenteric bloody stools. The stools quickly diminish in frequency, and become more solid and less offensive. The gelatin has the advantage of being free from taste and smell.

In cases of choleraic diarrhœa in infancy Freeny[8] advises beginning with **Calomel**, gr. $\frac{1}{10}$, every half hour until one grain has been taken: this is to be followed by **Castor Oil**, 2 dr. If the stools are large and very frequent he would give a **Starch Enema** with opium: 2 drops of tincture of opium with ½ oz. of starch can be given to an infant over a year old.

There is much difference of opinion as to the advisability of **Opium** in infantile diarrhœa. Smithe[9] says that opium or its derivatives only postpone disaster in cases of choleraic diarrhœa, whereas Mackenzie[10] says that **Morphine** is one of the most useful drugs in such cases. It should be given with atropine, thus: Morphine sulphate gr. $\frac{1}{100}$, atropine sulphate gr. $\frac{1}{500}$, aq. 5 min.: to be given hypodermically every hour to a child of one year, "till relief is obtained." Baum[11] advises that after the morphine and atropine injections have quieted the stomach to a moderate degree, a powder should be given every hour, consisting of calomel gr. $\frac{1}{10}$, pulv. ipecac. gr. $\frac{1}{60}$, pulv. apsic. $\frac{1}{10}$: every hour.

Loewenberg reports good results from **Adrenalin** in the cases where there is much exhaustion; he gives 1 to 2 drops of the 1–1000 solution of adrenalin chloride every hour until the pulse is of better tension and the vomiting controlled.

REFERENCES.—[1]*Bost. Med. and Surg. Jour.* in N. Y. *Med. Jour.* Sept. 12, 1908; [2]*Lancet*, Aug. 8, 1908; [3]*Berl. klin. Woch.* No. 46, in *Brit. Jour. Child. Dis.* Jan. 1908; [4]*Lancet*, Sept. 5, 1908; [5]*Amer. Jour. Clin. Med.* Aug. 1908, p. 1068; [6]*Arch. Pédiatr.* Jan. 1908; [7]*La Clin. Infantile*, Nov. 1907, No. 22; [8]*N. Y. Med. Jour.* July 25, 1908; [9]*Ibid.*; [10]*Ibid.* Aug. 8, 1908; [11]*Ibid.* Aug. 1, 1908.

DIPHTHERIA.

J. W. Goodall, M.D.

The length of time that some patients will remain infectious after an attack of diphtheria is well illustrated by a case recorded by T. Strain.[1] A young woman, a nursemaid, contracted diphtheria while residing in Somersetshire in December, 1907. She was isolated and not discharged from hospital till cultivations from the nose and throat were negative. She then went to a convalescent home and while there was again examined bacteriologically with negative results. On leaving the home she went into service: ten days later one of the children under her charge developed diphtheria: her throat and nose were again examined bacteriologically, and diphtheria bacilli were found to be present. She was again isolated and treated for five weeks, at the end of which period she was examined again and

declared to be "free." She went as nursemaid to another family, and in three weeks one of the children under her care was attacked with diphtheria; a fresh examination revealed diphtheria bacilli in the nasal passages. In July, 1908, the girl came under Strain's care, and bacilli were ascertained to be present in the nose, though there was no sign of diphtheria nor of any illness. For six weeks the patient was treated with local swabbing and douching with glycothymolin, cyllin, chinosol, and chlorine water. It was found that the bacilli were present during this period in the nasal passages intermittently, while the fauces were always free. Strain suggests that one of the sinuses opening into the nose afforded a nidus for the bacilli, periodically discharging its contents; at no time, however, was there any nasal discharge.

A convenient classification of the *Diphtheria bacillus* and the organisms which closely resemble it is made by C. J. Lewis,[2] as follows :—

Results produced.	Pathogenic to Man		Non-pathogenic to Man		
	Class A	Class B	Class C	Class D	Class E
	Bacillus diphtheriæ of Löffler	Virulent pseudo-diphtheria bacilli	Avirulent pseudo-diphtheria bacilli	Avirulent pseudo-diphtheria bacilli	Hofmann's bacilli
Produces a toxin fatal to guinea-pigs	Yes	Yes	No	No	No
The toxin is neutralized by diphtheria antitoxin	Yes	No	No	No	No
Produces acid in glucose-broth	Yes	Yes	Yes	No	No
Produces alkali in glucose-broth	No	No	No	Yes	Yes
Ferments dextrin	Yes	—	—	No	No
Ferments saccharose	No	—	—	No	No
Has a beaded or segmented appearance when stained	Yes	Yes	No	Yes	No

Class C includes such organisms as the xerosis bacillus and the *Bacillus coryzæ segmentosus*. The former of these ferments saccharose, but not dextrin, in serum-water. Though the organisms included in Class B are fatal to guinea-pigs, yet the post-mortem appearances are different from those produced by the organisms of Class A. Very little is known at present as to the distribution and frequency of the Class B organisms.

Under the name "*diphtheritic fever*," Sir John Moore[3] has described an outbreak of sore-throat which occurred in a girls' school in Dublin. Between Oct. 2nd and Nov. 11th, 1906, 18 out of a total of 43 girls were attacked; and two months later the disease appeared in the homes of two of the girls who had gone home for the Christmas holidays. A year later three fresh cases arose in the school. The symptoms of the illness were coryza, tonsillitis, a furred, desquamating tongue,

a patchy or punctate rash on the roof of the mouth and buccal mucous membrane, enlargement of the cervical glands, and a roseolar cutaneous rash. In three of the cases pocking subsequently took place. In only one case was there albuminuria. There was slight fever, the highest recorded temperature being 102·8° F. In no case was definite membrane observed. Bacteriological examinations were made in all cases, and an organism isolated which was "a form of the diphtheria bacillus." It was smaller than the diphtheria bacillus, and resembled somewhat Hofmann's bacillus. As the writer of the note in the *British Medical Journal* observes, it is open to doubt whether "diphtheritic fever" is a good name to apply to the disease described.

In a paper on the *irregularity of the pulse* in diphtheria, Owen H. Peters[4] points out that an irregularity of the pulse is not infrequently ascribed to that disease, whereas it is really due to some other cause. Most observers have stated that irregularity occurs in a very large proportion of diphtheria cases, even as high as 87 per cent. But Peters shows that if careful observations are made, irregularity of some sort will be found in a large proportion of cases of other acute diseases, especially in children. Thus in 100 cases each of diphtheria and scarlet fever, there were 80 cases of irregular pulse in the former disease and 82 in the latter. Many causes of irregularity are to be found in healthy children especially those connected with respiration. In cases of diphtheria, one is prone to attribute the irregularity to the disease and not to its real cause. For all that, cardiac irregularity occurs with some frequency in diphtheria—in at least 10 per cent of the cases. Care has to be taken not to confuse the different kinds of irregularity; otherwise patients may be kept in bed and in hospital for an unnecessarily lengthy period, or on the other hand, an irregularity due to changes in the heart muscle may be looked upon as being compatible with a normal state of health.

A case of what appears to have been *chronic diphtheria of the skin* of three years' duration has been put on record by Alan B. Slater.[5] The patient was a girl, aged 13, who came under his care on June 20, 1907. The history of the illness was that three years previously she had an attack of inflammation of the eyes. Shortly after this the child's mother discovered two white patches one on the inside of each labium, and a thin vaginal discharge, and next it was noticed that blisters began to appear round the vulva and to spread to the abdomen. The body and neck quickly became covered with blisters, and to a slight extent the face and head were affected. She was admitted into a general hospital, and was treated there for about five months, with little improvement in her condition. After leaving the hospital the patient was treated for some time with anti-syphilitic remedies internally, and with all sorts of local applications. When seen by Slater on June 20th, there was a profuse vesicular eruption on the left side of the mouth, the eyebrows, the ears, the scalp, neck and shoulders, and upper part of the back. The skin between the vesicles was of a dark red colour. The lower part of the abdominal

wall, the region of the vulva, and the inner part of each thigh were covered with vesicles. A thin, clear fluid was escaping freely from the vesicles. The child's general condition was good. A bacteriological examination of the fluid which was dripping from the vesicles on the face, revealed *Staphylococcus aureus* and *albus* and the Klebs-Löffler bacillus. The last named organism was recognized not only by its cultural appearance but by its pathological action on guinea-pigs. The presence of the diphtheria bacillus led to the treatment of the case with **Diphtheria Antitoxin,** which was commenced on July 2nd, when 2000 units were injected subcutaneously. On July 4th 1000 units, and on July 9th, 11th, 15th, 17th, and 19th, 2000 units were injected. The eruption quickly lessened, and by July 22nd it had disappeared. Local treatment consisted in painting some of the bullæ and vesicles with **Carbolic and Glycerin** on July 8th, and two days later with a solution of **Carbolic in Alcohol,** 1–20, this application being followed by a dusting of the lesions with boric acid powder. The same treatment was repeated on July 19th. Probably the disease started in this case in the eyes, and the vulva became infected secondarily. A similar case so far as the skin lesions are concerned has been recorded by Eddowes,[6] but the disease was not of such long duration as in that of Slater.

Theodore Fisher[7] draws attention to certain *complications* which have not hitherto attracted much notice: *enlargement of the liver, disease of the arterial vessels, cardiac thrombosis,* and *interlobular emphysema.* Enlargement of the liver is perhaps the least uncommon of these complications, though they are all more or less rare. It has been noted by Marfan, J. D. Rolleston, and others. It may be made out during life, and is a most unfavourable sign. Fisher states that he has found it in eight out of twenty-six autopsies. It appears to be secondary to cardiac dilatation and failure, and not to fatty changes in the hepatic cells. The arterial changes can be recognized only after death. They consist of fatty degeneration in the vessels, and are to be seen chiefly in the aorta. Fisher quotes Klotz as stating that diphtheria toxin produces degeneration of the middle coat, while in other infective diseases the inner coat is affected. [In my experience this fatty degeneration is not common, at any rate so far as it can be observed with the naked eye.—E. W. G.]. Thrombosis of the heart or of a blood-vessel is decidedly rare. Interlobular emphysema can be seen in cases where the larynx is obstructed. Air escapes from the alveoli, and collects in small patches beneath the pleuræ; but it may reach the mediastinum or the subcutaneous tissues of the neck and chest. In rare cases pneumothorax may be produced. None of these complications are confined to diphtheria; they may occasionally be met with in other acute infectious diseases.

A very instructive case of *Diphtheria followed by Paralysis* is given by A. B. Sloan.[8] The patient was a boy, aged 5, who was admitted to hospital on the fourth day of a severe attack of diphtheria affecting the fauces and nasal passages. On the sixth day there was

profuse epistaxis, and on the seventh two bruise-like hæmorrhages appeared beneath the skin over the sacrum. Two days later the throat was free from membrane. On the eighth day paralysis of the palate was noticed, and slight difficulty in swallowing. On the thirteenth day the larynx became paralyzed. From the tenth to the thirteenth day there had been very occasional vomiting, but the heart's action and the pulse had remained fairly good. On the fourteenth day, however, the heart became feeble and irregular, and the pulse at the wrist could hardly be felt; vomiting, too, was more frequent than before. The next day the cardiac dullness extended one inch external to the nipple line. On the nineteenth day albumin, in large amounts, appeared in the urine but the latter was not scanty. On the twentieth day the face became puffy, and during the next two or three days marked œdema of legs, face, and scalp was to be seen. It should be stated that, as part of the treatment, the boy's head was hung over pillows. After the seventeenth day vomiting did not occur. The boy wasted very considerably and remained in a most serious condition until about the fiftieth day of the illness, when he began to get better, and making steady and uninterrupted progress was discharged well from the hospital about six weeks later.

It can hardly be doubted that but for most careful treatment and nursing this patient would have died. On admission 30,000 units of antitoxin were given subcutaneously, and on the sixth and seventh days 18,000, so that he received 72,000 units altogether. Sloan admits that possibly he gave an unnecessarily large amount; still it is better to err on the safe side in a case of this sort, and no harm can come from giving a large dose of antitoxin. When vomiting began to be frequent, on the fourteenth day, all feeding by the mouth was stopped, and rectal feeding ordered. This consisted of four ounces of peptonized milk every four hours, occasionally with the yolk of an egg. The patient was kept on rectal feeding for twenty-two days; on two occasions during this period, as vomiting had ceased, feeding by the mouth was tried, but as the patient could not retain the nourishment, was not repeated. After the twenty-second day of rectal feeding, nasal feeding was resorted to, Benger's food being given. This was continued for another seventeen days, after which date the patient took nutriment in the natural way. The boy was kept strictly at rest. When the pharynx and larynx became paralyzed the head was hung over pillows, to prevent him from being choked by saliva getting into the larynx and lungs. This position of the head, together with the cardiac failure, was doubtless the cause of the œdema of the face and scalp: anasarca is very rare in diphtheria. Belladonna was given for the vomiting and to lessen the flow of mucus and saliva. Brandy in one-drachm doses every four hours was administered so long as the heart was feeble, and occasionally a subcutaneous injection of strychnine was given. Sloan in his remarks on the case points out that paralysis is much more likely to follow a severe than a mild

attack of diphtheria, as has been insisted upon by most writers whose experience of the disease is at all extensive.

In an article on the treatment of diphtheria by antitoxic serum, J. Brownlee[9] draws attention to the fact that occasionally one meets with a serum which does not appear to have the same therapeutic effect as those that have hitherto been in use. Variations of this nature may be found in sera supplied by the same maker. These variations are believed by Brownlee to be due to "differences in the bodies contained in the different consignments of serum. It would seem that the poisons produced by the organism of diphtheria call forth a different response in man and the horse. Though the chief poison of the diphtheria organism is easily neutralized by the specific antitoxin, yet there are probably a number of other poisons which act more powerfully on man, and for which the horse-serum consequently contains very variable amounts of antibody." Brownlee suggests that, to make the serum, various strains of diphtheria bacilli from the localities where the serum is to be used should be employed for immunizing the horses.

Some years ago Landouzy made the statement that the majority of children who had undergone tracheotomy subsequently became affected with pulmonary tuberculosis. W. Wolf[10] made enquiry into the after-history of 173 children who had been operated upon for diphtheritic croup in Trendelenburg's clinic at Leipsic during the years 1895–1907. He found that four of them had died—one of scarlet fever and nephritis, one of pneumonia (three weeks after leaving hospital), one of cardiac paralysis, and one from some unknown cause. Leaving these four cases out of account, there were 169 cases, and of these 143 were in good health and twenty-four showed laryngeal signs, such as hoarseness, mild periodic dyspnœa, tuberculosis, and other conditions. There were four cases of tuberculosis, and in three of them there was a family history of that disease.

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DISLOCATIONS. *Priestley Leech, M.D., F.R.C.S.*

Dislocation of the Sternal Ends of the Clavicle.—The treatment of this condition has not been very satisfactory, but Middlebro'[1] reports a case treated by fracture of the bone. The patient was a girl, eighteen years of age, in whom the sternal ends of both clavicles would so easily dislocate that the performance of ordinary household duties was impossible. Various methods of treatment had been tried in vain ; both clavicles were very straight, without much anterior curve, and it seemed that when the shoulders went back the first rib acted as a fulcrum and forced the clavicles out. In order to prevent this leverage action taking place, it was decided to fracture the clavicles at the fulcrum point. Middlebro' sawed nearly through both clavicles at a point one inch from the inner

ond, so as to be about the middle of the costo clavicular or rhomboid ligament, which had half its fibres thus attached to each fragment, and on bending the shoulders back both bones were broken through. The shoulders were held back by figure-of eight bandages, so that they were in the utmost position that had previously caused the dislocation, and they thus healed with a considerable angle at the point of fracture. The right clavicle was never dislocated after the operation: the left did so after the operation, but had not for eight months, and the girl was able to do household duties which she had previously been unable to do.

Dislocation of Shoulder-joint, complicated by Fracture of the Upper Extremity of the Humerus.—The treatment of this condition is a vexed question, and it is impossible to lay down a hard-and-fast rule which will be applicable to every case. The tendency, however, is in suitable cases and under favourable conditions to interfere by operation. Mason,[2] of Alabama, reports a case of double dislocation of the shoulders, with fracture of the surgical neck of the right humerus, in which, after failure to reduce by manipulation, he performed an arthrotomy, reduced the dislocation, and wired the fracture, with an excellent result. In most of the text-books too great stress is laid upon the efforts to reduce by manipulation, and McBurney cites six cases where death resulted from the violent and persistent efforts which were resorted to in attempting to bring about reduction. The older methods of treating fracture-dislocation were:—

1. Reduction by manipulation. This should still be practised with gentleness.

2. Securing union of the fracture, and then attempting reduction by using the re-united shaft of the humerus as a lever. Dyer, cited by McBurney, collected ten cases thus treated, with seven absolute failures and three doubtful successes. Mason in a further series found one so treated, and refracture of the humerus occurred. This method should not be used.

3. The Riberi method. Use early passive motion, with the object of making a false joint at the point of fracture, and leaving the dislocation untreated. At the present time this method is not worthy of consideration.

4. Resection. This is still in many cases—especially those of long standing—the best thing possible. It should only be used when reposition is impossible.

5. At the present time the best way is to first secure reduction of the dislocation, and then treat the fracture.

Failing in reasonable attempts to secure reduction of the dislocation by manipulation, immediate arthrotomy with reduction of the dislocation, with or without the use of hooks, followed by suture or reduction and immobilization of fracture, is the ideal method. Recorded experiences with the hook do not seem to establish for it any superiority over open arthrotomy. Mason has collected twelve cases where the hook was used, and it failed to reduce the dislocation in six instances.

McBurney collected 117 cases up to 1894; since then Mason has collected 63 cases, including his own, which gives a total of 180 reported cases. In these series the fractures have been classed as follows: Fractures of the surgical neck 37 cases, of the anatomical neck 26. The dislocations are: subcoracoid 31, subspinous 2, subglenoid 11, not stated 19. Efforts to reduce by manipulation were successful in 7 cases, of which 3 recurred, and one was of doubtful success. Failure is recorded in 37 cases, and in 19 it is not stated that attempts were made to reduce, but it is quite likely that in every case some effort was made before resorting to operation. Fracture or refracture occurred in attempting reduction in 7 instances. He has also collected 21 cases of dislocation with fracture of the greater tuberosity.

From the condensed tables Mason finds 23 cases of arthrotomy with reduction and 14 good results—60·8 per cent—against 21 resections with 9 fair results—that is, 42·8 per cent. The cases classed as "good" include those where there is practically no impairment of function, and in several instances it is distinctly stated that there was perfect restoration.

Early arthrotomy in dislocation with fracture at the surgical neck show 18 operations with 12 good results, and adding McBurney's first case, 19 cases with 13 good results—68·5 per cent. The tables of recent cases include everything within the first month after injury. A much higher percentage of perfect recoveries would follow immediate operation in all cases which manipulation failed to reduce.

In fracture at the anatomical neck the conditions are different from those at the surgical neck. When the fracture is at the anatomical neck and the head is entirely separated, it is cut off from its blood-supply, and if any infection occur, the separated head, on account of its poor blood-supply, will almost certainly undergo suppuration and necrosis and require secondary excision. If one to four weeks be allowed to elapse, and the ends of the bones become smoothed over, the upper fragment is too small to permit of freshening, as might be done with fracture at the surgical neck, and excision will have to be practised. After reduction the head should be attached to the shaft by sutures or nails.

Mason has also collected twenty-one cases of dislocation with fracture of the greater tuberosity. The humeral shaft is still available as a lever for reduction of the dislocation, but the tuberosity frequently becomes detached and is displaced between the head of the humerus and some of the overhanging processes of the scapula, acting as an obstacle to the return of the head of the humerus to the glenoid cavity. If left untreated and displaced, even if the dislocation is reduced, the fragment will either attach itself to the humerus in some abnormal position, thereby impairing the movements of the joint, or may be drawn into the capsule and become attached somewhere inside the joint cavity, to interfere with the free movements of the shoulder.

In early cases the dislocation should be reduced by manipulation, if this can be accomplished with gentleness, and the tuberosity should be

nailed into position. If this treatment prove unsuccessful, the dislocation should be treated by arthrotomy and reduction, and the tuberosity should be nailed down in its proper position. It should be removed if it cannot be replaced. In old cases it will be necessary to perform arthrotomy, remove exostoses and tuberosities united in abnormal positions, and then reduce the dislocation. Where the entire upper extremity of the humerus is crushed, no general plan of treatment can be laid down, and the judgment of the operator must dictate the plan of procedure. Excision, however, often gives very useful arms, and is to be preferred to allowing the cases to go on to probable ankylosis with excessive callus thrown out around badly displaced fragments. Rigid asepsis is essential in securing good results, and these operations should not be undertaken where this cannot be carried out.

References.—[1] *Lancet*, Vp. 18, 1908; [2] *Ann. Surg.* May, 1908.

DUODENAL ULCER. (*See* Gastric, Pyloric, and Duodenal Ulcer.)

DUPUYTREN'S CONTRACTURE.

(*Vol.* 1891, p. 352; 1907, p. 240.—Adams's operation consists in subcutaneous division of as many bands of contracted fascia as can be found, by multiple puncture, followed as soon as possible by extension. Keen recommends an open operation in which a palmar flap is dissected out under local anæsthesia; the palmar fascia is then dissected away from the under surface of this flap. There is a diagram in the 1907 *Annual*. Fibrolysin and thiosinamine, accompanied by extension, have been injected into the contracted fascia with good results.

DYSENTERY. (*See also* Stomach, Surgical Diseases of.)

J. W. W. Stephens, M.D.

J. Cantlie[1] attributes many cases of chronic dysentery, chronic muco-colitis, and diarrhœa following sprue, to narrowing of the sigmoid, and especially of the "pylorus" between the sigmoid and the rectum. Examination can only properly be made by means of a sigmoidoscope. The presence of a stricture can be determined by the passage of a soft tube, and if a stricture exists, cure of the symptoms can be effected by the passage of bougies of increasing size.

F. M. Sandwith[2] gives the following among other points of difference between bacillary and amœbic dysentery: (1) Amœbic dysentery is chronic unless carefully treated from the beginning, while the bacillary form lasts only from four to eight days in mild cases, three to six weeks in serious; (2) Toxic symptoms, such as high fever, rapid emaciation, and nerve complications, exist in bacillary, but not usually in the amœbic form. The general treatment of acute dysentery of either form is the same.

Bacillary Dysentery.—(1) Rest in bed, and a pad of cotton wool on the belly, kept in place by a bandage. (2) Solid food is stopped, and small quantities of liquid are given every two to three hours. (3) If the tongue is clean, boiled milk, peptonized or diluted with rice water. If the tongue is coated, chicken broth, albumen-water, whey, or rice-water; all food to be given *tepid*. (4) Although the patient may be passing a motion every hour, yet it is necessary first to clear the bowels

—castor oil in a single dose, or drachm doses of magnesium or sodium sulphate, or $\frac{1}{6}$ gr. of calomel every hour until a fæcal motion results, generally after four or five doses. The bed-pan must always be used. If there is much hæmorrhage, an ice-bag is placed over the abdomen or enemata of iced water are given, and opium internally. Tenesmus is diminished by small enemata of saline solution; cocaine, opium, and belladonna should also be used. Collapse is met by the subcutaneous injection of saline solution. The patient is allowed to drink simple acid lemonade or a solution of lactic acid (1–3000) to relieve thirst.

Serum Treatment.—The dysentery bacillus secretes a soluble toxin, so that a true antitoxic serum can be produced. The results got with serum treatment are indeed excellent. [But so far we have no information as to the keeping properties in the tropics of the products of various firms, a fact which prevents their being much used.—J. W. W. S.]

Amœbic Dysentery.—Rest is highly necessary, and may require hypodermics of morphia. **Salicylate of Bismuth** in 15-gr. (or even 1-dr.) wafers every four hours is a most useful drug by the mouth as a continuance. If an astringent is advisable, **Tannigen** should be added. The author gives the following as Sir Patrick Manson's method of administering **Ipecacuanha** in chronic dysentery. The patient is starved for four hours, not even having any water; a mustard plaster is placed on the epigastrium, and he is made to lie flat without any pillow: 15 min. of laudanum in water are then given, and after fifteen minutes 30 gr. of ipecacuanha powder. The patient is kept *rigidly* at rest, the lips are wiped by a nurse if any froth is present, to avoid *any* movement, and no food is given for three hours. On the next night the proceeding is repeated: ipecacuanha 25 gr., preceded by laudanum 10 gr.; on the third night ipecacuanha 20 gr., laudanum 5 gr.: on the fourth night ipecacuanha 15 gr.: on the fifth night 10 gr.; on the sixth night 5 gr.; 5 gr. of ipecacuanha are then given nightly for seven to ten days. The ipecacuanha can be put up in the form of "membroids," which are not absorbed till the small intestine is reached, and so the danger of vomiting due to the ipecacuanha is reduced. As stated above, 1-dr. doses of magnesium sulphate every hour until a motion is obtained is a form of treatment much advocated. Sulphur, 30 to 60 gr. three times a day with Dover's powder, is also useful.

Enemata.—Nitrate of silver 1–1000, or sulphate of copper in the same strength. A soft rectal tube three feet long, greased with boric vaseline, is passed. A funnel is attached and the warmed fluid allowed to run by gravity, the feet of the bed being raised twenty-four inches. If the anus is very sore through secretions, a cocaine suppository may be inserted half an hour previously. A pint of solution is easily retained, the amount being gradually increased up to four pints. The enema is retained five minutes and is given once a day, and at night a simple cleansing enema of two pints of water, in which, while warm, one ounce of linseed has been allowed to soak for some hours. The use of a sigmoidoscope or large rectal speculum will enable the condition of the ulcers to be watched during treatment.

Sandwith in another communication[3] gives further particulars. To relieve tenesmus, a small enema of starch and opium *after* each motion often gives great comfort, and produces sleep. Where motions occur every half-hour, the magnesium sulphate treatment as given above is the best. The author further recommends large enemata in the acute stage of the disease in order to cut it short. The enema of linseed (two pints) is given at night, and the nitrate of silver enema in the morning. The soft rubber tube is passed some six inches into the gut, and the enema should take about twenty minutes to flow in. If the nitrate of silver enema is painful, as it sometimes is, it may be necessary to give morphia hypodermically. Further, the author gives **Salicylate of Bismuth**, with or without tannigen and opium, every four hours by the mouth. It is of the highest importance to get rid of the amœbæ by enemata, a form of treatment which the author most strongly recommends, *before* the patient becomes a chronic case.

L. P. Stephen[4] records a case of chronic dysentery subjected to various treatments in the course of five years, completely cured by **Vaccino-therapy** (*vide Ind. Med. Gaz.* June, 1907).

D. J. Drake[5] is stated to have got good results in the treatment of dysentery by the use of **Yellow Santonin**, which is easily obtained by exposing white santonin to sunlight. The dose is 0·3 gram in olive oil 8 grams, three times a day, every other day.

J. G. Murray[6] records several cases of hepatitis following dysentery treated by **Ipecacuanha** with strikingly successful results. The cases must be in the *pre-suppurative stage*. In most cases there is a recent history of dysentery or diarrhœa, the onset is insidious, fever is usually present, and there is generally a leucocytosis in which the polynuclears remain at or about their normal value, this point being of great diagnostic value. Further, the absence of any shadow when X rays are used negatives in most cases the presence of an abscess. The ipecacuanha may be given in keratinized capsules, and chloral hydrate is a good substitute for opium in the preliminary treatment to prevent vomiting (L. Rogers).

Raymond[7] advocates the use of **Ipecacuanha** in the treatment of amœbic dysentery. The drug produces a prompt disappearance of the amœbæ. The mode of administration is as follows. In the morning, the patient being in bed, a purge is given, and some milk. At 8 or 9 p.m. the room is darkened, the mouth is washed, and the patient urged to keep as still as possible after taking the drug. In the case of an adult, 30 drops of opium, and after twenty minutes 6 gelatine capsules, each containing 5 gr. of ipecacuanha, are swallowed with as little water as possible. An ice-bag is placed on the head and a plaster on the stomach. The same routine is followed for two days. The patient soon accommodates himself to the ipecacuanha.

J. A. Pottinger[8] recommends **Appendicostomy** in those cases of chronic dysentery which have resisted all treatment. It enables the large intestine to be freely irrigated. The operation does not last more than ten minutes. After forty-eight hours the appendix was divided and a

No. 8 catheter passed, and a tube passed into the rectum to allow of the escape of fluid. Irrigation was then carried out in the following way: (1) Seven pints of soapsuds were introduced slowly. (2) On the fourth day, in addition, seven pints of 1 per cent solution of sanitas. (3) On the fifth day systematic lavage was begun—five pints of bicarbonate of soda solution (1 per cent) to remove mucus, and three pints of nitrate of silver (20 gr. to the pint). (4) After ten days fifteen pints of the soda solution were used, and even after this quantity the washings were still fæcal, probably owing to reflex peristalsis. The rectal tube was withdrawn as soon as the silver solution began to pass out. (5) At the end of a month the silver nitrate solution was increased to 40 gr. to the pint, and the washing carried on for a week. The catheter used at first was replaced by a soft rubber tube, and this was left in the opening, being removed each day for cleaning. The condition of the patient rapidly improved after the first irrigation.

E. A. R. Newman[9] recommends strongly the use of **Forster's Anti-dysenteric Vaccine** in the treatment of chronic dysentery.

H. Steiner,[10] in serious cases of chronic dysentery, advocates the following surgical treatment: (1) A large cæcal artificial anus is made close to and slightly below the valve of Bauhin (ileocæcal). (2). Free antiperistaltic washings-out of the whole colon are then resorted to, with 6 to 10 litres of water at body temperature. (3) When the washings are clear, a weak solution of iodine or protargol is passed through. (4) When from the character of the washings it appears that the ulcers have healed—in one case about nine months after the operation—the artificial anus is plugged up with plugs of lint steeped in vaseline, to see if the passage of fæces along the ordinary route is unaccompanied by any return of symptoms. (5) If this is so the artificial anus is closed, an operation not requiring a general anæsthetic.

Thornburgh[11] uses **Argyrol** in the treatment of dysentery. Daily injections of 1 litre of 1 per cent argyrol solution are given; these should be retained as long as possible. At the end of each week 100 cc. of a 10 per cent argyrol solution are injected, to be retained for some hours. The amœbæ disappear in one or two days. None of the cases had relapsed in nine months.

Rheindorf[12] publishes a case of dysentery in Germany due to invasion of the mucosa by a ciliate, *Balantidium coli*. He believes that the ciliate is the real cause of the disease and not a post-mortem phenomenon. Association with pigs, which normally contain this parasite in their gut, is probably accountable for the infection.

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DYSENTERY, AMŒBIC. (*See* Stomach, Surgical Diseases of.)

EAR, CERUMEN IN.

(*Vol.* 1893, p. 195; 1896, p. 259)—The removal of [illegible] masses of wax is facilitated by some method of loosening used before syringing. The plug may be separated gently from the rest of the external [illegible] by the [illegible] a blunt instrument, or more easily and safely by the preliminary [illegible] drops consisting of Sodii Bicarbonat. gr. xv, Glycerini 3ii, Aq. [illegible] 3i, to be warmed before use.

EAR, DISEASES OF. (*See also* VERTIGO.)

William Milligan, M.D.
W. Douglas Sewell, M.B.

Otitis Externa.—Hamm[1] describes a case of bilateral otitis externa apparently caused by the use of the telephone. The patient, a postmaster, who had six months previously taken up a new billet which necessitated frequent use of the telephone, came under the writer's notice complaining of severe irritation and a feeling of fullness in both ears, deafness, and a disagreeable fetor arising from the ears which was perceptible to any bystander. On examination, the meatus of each ear was found to be markedly narrowed and filled with foul, moist, yellowish masses. These were removed, and the skin of the meatus was then seen to be much swollen and reddened. Only a limited view of the membrane was possible, and this on the right side was normal; on the left the region about the long process of the hammer was swollen and congested and presented an appearance as if the membrane had been scratched with a fine needle. The hearing power after clearing out the meatus was normal. Nine days later, during which interval no treatment had been instituted, the meatal walls were found to be covered with foul-smelling, viscous, ceruminous-like masses, and, these being removed, were seen to be still red and swollen. Further use of the telephone was forbidden, and syringing of the ears with warm water, followed by the insufflation of **Xeroform**, ordered. Two months later both ears were found to be quite normal. A slight but similar attack occurred three months later, owing apparently to the fact that the patient had been short-handed and had again to use the telephone frequently. It is pointed out that a telephone acts as a condenser, and that it has been proved that a certain amount of current passes over into the manipulator. Given a peculiar degree of susceptibility on the part of the operator, such a current would readily give rise to irritation with a resulting otitis media.

Examination of Eustachian Tube.[2]—By the use of the salpingoscope, a small instrument of the same nature as the cystoscope, which is introduced into the nasal fossæ, the detection of abnormalities in the fossæ of Rosenmüller is simple. The chief pathological change consists in an excess of lymphoid tissue, or in later life the presence of fibrous bands which pull on the posterior aspect of the Eustachian tube. Either of these conditions interferes with efficient opening and closing of the tube and proper ventilation of the middle-ear cavity, and so gives rise to and keeps up the most obstinate forms of middle-ear catarrh. The tubal obstruction is also an important factor in determining the course of an infective otitis media. Any lymphoid

tissue present should be removed with the curette, and adhesive bands broken down with the finger or a cutting instrument ; this may need to be repeated, and silver nitrate applied until the mucous membrane has healed and is free from adhesions.

Aural Discharges.—Wyatt Wingrave,[3] in a long and exhaustive paper, embodying the results of many years' work, deals very fully with the clinical pathology of aural discharges, and summarizes his conclusions as follows :—

" Acute suppuration of the middle ear in its mild (catarrhal) form is characterized by sharply defined leucocytes (polymorphs), very few lymphocytes and tympanic epithelium, singly or in clusters. A Gram-negative diplococcus (*Micrococcus catarrhalis*) most frequently occurs, occasionally associated with mouth organisms such as spirochætæ and torulæ. In the severe or suppurative type leucocytes and erythrocytes predominate at first, with a few lymphocytes. Later the erythrocytes disappear, while large mononuclear leucocytes become well marked on about the third or fourth day. Tympanic epithelium occurs early, but disappears until healing commences. The cytoplasm of the leucocyte becomes granular and ill defined, while the nucleus stains faintly and is distorted and fragmented towards the second week. In infants, lymphocytes are much more numerous than in adults. Many bacteria are found in acute discharges, including ' throat organisms,' but the more prominent are *Diplococcus catarrhalis*, *D. pneumoniæ*, *Streptococcus brevis* and *longus*.

" *Acute external otitis* may occur in several degrees, from an acute desquamative process involving the superficial structures only, characterized by nucleated squames, gland epithelium, and leucocytes, to abscess or purulent cellulitis involving the deep structures, when leucocytes and lymphocytes will be abundant, accompanied by streptococci, diplococci, staphylococci, and also rarely gonococci. When the disease assumes a chronic form the disharge is ' watery,' lymphocytes and leucocytes being few or wanting. Epithelial squames are plentiful, and among many varieties of bacteria the *Penicillium glaucum* is prominent.

" The conditions responsible for chronic discharge from the middle ear are so varied that pathological accuracy demands some differentiation.

" As most frequently happens, ' granulating tissue ' is responsible for the pus. Evidence of this is afforded by the presence of leucocytes of all kinds, large, small, mono- and polynuclear, normal and degenerated, but especially by *lymphocytes*, which are very numerous, while epithelial cells are not uncommon. Bone disease may be marked by myelocytes or osteoblasts.

" Cholesteatoma is indicated by the presence of closely packed acid-fast squames with or without bacteria. This latter may appear to be an unnecessary distinction, but it is really one of great importance, especially when the cells are of antral source, for a septic cholesteatoma in that situation affords a stronger reason for radical measures than

a non-septic one: an interpretation which is amply supported by examination of antral contents removed by operation.

"Among the many varieties of chronic discharge there is one which deserves special attention. It is generally very profuse, intermittent, extremely fœtid, opaque, and of the consistence of cream. It is found to be entirely free from cells, either epithelial or leucocytic, but consists entirely of throat organisms in an albuminous matrix. Strictly speaking it is therefore not true pus, but merely a polymicrobic emulsion. It appears as if the imperfectly drained and ventilated antrotympanic cavity had assumed the rôle of a cultivating chamber or 'septic tank' containing bouillon in which different families of bacteria abundantly flourished.

"By the term 'throat organisms' is meant a group of bacteria which are nearly always to be found in the mouth and faucial area, either in health or disease, but do not occur in the healthy ear. It includes *Spirochæta fœtida*, *Bacillus fusiformis*, Leptothrix, *B. subtilis*, *B. proteus vulgaris*, *Penicillium glaucum*, together with a large variety of moulds and yeasts which may be potentially pathogenic, but for the time are leading a saprophytic existence in the throat.

"In this group of cases, which is by no means a small one, a highly 'septic' state of the mouth, fauces, or nasal cavities invariably coexists, the commonest form being pyorrhœa alveolaris and chronic lacunar tonsillitis, affections which are probably not only responsible for the original infection, but also for repeated renewals of the aural trouble.

"With such a discharge, whose most striking feature is the large number of spiral and fusiform bodies with practically no leucocytes or lymphocytes, the existence of an active granulation surface may unhesitatingly be excluded. There is a passive yet highly septic cavity which calls not only for active aural measures, but also for attention to the original source of infection. It is the differentiation and identification of such a condition as this that will fully repay the extra trouble of a microscopical examination of the discharge. Such cases further illustrate the necessity for a bacteriological examination of the nasopharynx, which I have found in healthy subjects to be sterile, but invariably septic in all acute and chronic infections of the antrotympanic cavity.

"It is important to note that in *acute exacerbations* of the chronic suppurative form the discharge somewhat resembles the primary acute. Freshly exuded leucocytes prevail with a diplococcus, Pfeiffer's bacillus or streptococci, and diplococci. Lymphocytes are often numerous, and myelocytes may be seen should there be any bone complication. In the course of a few days mononucleated leucocytes become plentiful, with a few more lymphocytes and nucleated squames.

"In tuberculous examples of this group there will also be present the specific bacilli. But tuberculous discharge, when chronic, is of a very distinct type. It is thinner or watery in character, with white granules or flakes. Lymphocytes are plentiful, with large epithelioid and even

'giant-cells.' Leucocytes are far less numerous than in non-tuberculous examples, except during an *acute* period due to supplementary infection, when the discharge is denser and distinctly purulent in type. The presence of minute amorphous granules and 'bone grit' is also a marked feature of tuberculous discharge. Giant-cells are rare unless the specimen be taken directly from its source. As in tuberculous sputum, *Micrococcus tetragonus* is a frequent attendant. When the process is mixed, as usually happens, many varieties of bacteria will be present and attended by marked fœtor.

"In *acute osteomyelitis*, the discharge contains, in addition to leucocytes and lymphocytes, considerable numbers of large mono- and multinucleated myelocytes, which are easily distinguished by their size, shape, nuclei, and staining. There may be many bacteria present, but few varieties, diplococci and streptococci predominating.

"*Chronic desquamative external otitis* may be either moist or dry. In the former many bacteria are present, with but few leucocytes and many squames, old and new. The commonest bacteria are staphylococci, *Bacillus butyricus*, *B. proteus vulgaris*, mycelia, and torulæ. In the dry form only scales occur with *Aspergillus niger*, *Penicillium glaucum*, *B. butyricus*, and *B. proteus vulgaris*. In every form acid-fast squames are a very prominent feature."

Otitis Media (*Acute*).—Blagdon Richards[4] recommends that in cases of otorrhœa the following lotion be used after previous cleansing of the meatus with **Boric Lotion** :—

R	Boric Acid	℥j	Glycerin	ad ℥j
	Sp. Vini Rect.	℥ij		

It is non-irritant and non-toxic. Owing possibly to its high specific gravity—about 1200—it has a property of easily penetrating recesses in the middle ear and displacing and floating up pus found there (sp. gr. of pus is 1030), and so reaching the seat of the disease. It is used with the greatest advantage when the drops are put in as the patient goes to bed; if he goes to sleep lying on the unaffected side during the night, the lotion has time to work its way into all the small recesses of the middle ear. The lotion should be used twice or three times a day. It has proved of much value in early cases of acute otitis media, and in the author's opinion frequently obviated the necessity of the operation of paracentesis.

Pneumo-Massage.—Macleod Yearsley[5] points out that although pneumo-massage is a therapeutic agent in certain aural affections, and has been extensively employed on the Continent, no British otologist has published any results as to its value in this country. He himself has been using the method for the past four years. In *otosclerosis* in only two out of thirty cases was any improvement observed, and these were both early cases. The writer opines that if applied early in the disease pneumo-massage would prove of great value. This view, however, is quite contrary to the generally accepted theory that local treatment in otosclerosis is harmful. A stroke

of 2 mm. with a speed of 1000 to 1500 vibrations with the hand-power instrument, and of 3000 to 6000 with the electro-motor masseur, was used. Each sitting lasted at first half a minute, and was gradually increased to two and a half minutes, and in some cases the applications were made daily.

In cases of *chronic middle-ear catarrh* the results were much better. In 50, i.e., 118 ears, in 86 of which tinnitus was complained of, permanent improvement of the hearing occurred in 50 ears; the tinnitus was much diminished in 40 out of 86, and completely relieved in 20 out of 86 cases. In 5 cases there was fixation of the malleus, and after that bone had been mobilized under nitrous oxide anæsthesia, pneumo-massage was of great service in maintaining the recovered mobility. In some of the above cases the massage was used in conjunction with inflation and tympanic injection, but in a few it was only started after these measures had been found unsuccessful, and proved of the greatest value. Pneumo-massage is of most value in that stage of chronic middle ear catarrh when the ossicular chain is first becoming restricted in its movements and paracusis Willisii is to be regarded as an indication for treatment rather than as a bad symptom.

Mastoid Disease.—Dench[6] discusses the indications for opening up the mastoid antrum and cells in acute cases from the point of view of the general practitioner and surgeon. Usually the diagnosis of mastoid involvement is simple. Marked tenderness on palpation is made out either just behind the superior attachment of the auricle, or over the tip of the mastoid, or more posteriorly over the mastoid emissary vein. Rarely there is absence of tenderness in these regions, and it can only be elicited by putting the finger into the external auditory canal and pressing backwards on the anterior mastoid surface. The occurrence of œdema over the mastoid process, while frequently significant of mastoid inflammation, is more usually due to a furuncle on the posterior meatal wall. Œdema, then, must not be taken as evidence of extension to the mastoid without a thorough examination of the ear. The presence of a fluctuating swelling indicates that there has been suppuration in the mastoid cells, and that the abscess has evacuated itself through the cortex. Sometimes in mastoiditis a diffuse brawny swelling occurs under the sternomastoid muscle, and indicates the rupture of an abscess through the mastoid tip into the digastric fossa. In most cases of acute otitis media there is tenderness over the mastoid tip which usually persists two or three days. Tenderness over the mastoid antrum is more significant; it is sometimes present in cases of simple otitis, but if it persists longer than two or three days in spite of free drainage of the middle ear, the mastoid cells and antrum should be opened. A still stronger indication for operation exists where the mastoid tenderness reappears after an interval of a few days in cases where the membrane has been incised and free drainage from the middle ear established. The temperature is deceptive, especially in adults, and may be normal in the presence of extensive destruction of the mastoid; in children it is more usual

to get a rise in temperature. In the writer's opinion an examination of the blood fails to throw much light on the question of mastoid involvement, although it may possibly be of value where the infective process has advanced so far as to involve the meninges or brain.

Out of 37 cases of acute otitis in which a bacterial examination was made, in 8 the smears were negative, indicating a mild congestion of the middle ear with serous effusion; in 8 the infection was due to the staphylococcus, in 10 to streptococcus capsulatus, in 2 to latent streptococci, in 3 to streptococci (two of them occurring as a mixed infection), 2 to pneumococcus and streptococcus, 2 to pneumococcus, and 2 to pneumococcus and staphylococcus. Out of these 37 cases 7 came to the mastoid operation; in 2 the condition was due to mixed streptococcic and pneumococcic infection. In one case no examination was made. In the fourth staphylococci, in the fifth and sixth streptococcus capsulatus, in the seventh mixed infection with streptococcus, were found. A consideration of these cases would seem to show that where the examination of the discharge from the middle ear was negative, or only showed staphylococci, mastoid complication is not apt to occur. This cannot be taken as an invariable rule. It is interesting to note that out of the 10 cases of streptococcus capsulatus infection, only 2 came to the mastoid operation; 8 made a perfect recovery after early free incision of the drum membrane. The streptococcus capsulatus infection is regarded by otologists as being particularly virulent, and calling for early opening up of the mastoid process, even in the absence of classical symptoms. The above statistics would argue that if an early and free incision of the drum membrane is made, very few cases of otitis media will proceed to mastoiditis and need further operation.

Knyvett Gordon[7] points out that in the acute otitis of scarlet fever there occurs an infection along the whole antro-tympano-tubal tract, and that an otitis is frequently present in the acute stage. There is practically no opportunity given for incision of the membrane, since the affection is frequently of painless onset and rapidly leads to its necrosis, so that when attention is drawn to the aural condition, often first by the purulent discharge, a very large perforation is found and no incision would improve the drainage from the middle ear. Under careful antiseptic irrigation, the majority of scarlatinal otorrhœas can be cured; some few cannot, owing to the presence of carious bone, either in the attic or in the mastoid.

In hospital cases, where the patient will seldom receive any attention on leaving, Gordon prefers to perform the radical mastoid operation. Most aural surgeons, in an acute mastoiditis, would be content with a thorough opening up of the mastoid antrum and cells. It is pointed out that the prospect as regards hearing, in scarlatinal cases which are subjected to the mastoid operation, is much better than in the cases of chronic otorrhœas of other origin, owing to the fact that the latter are only subjected to operation after a prolonged discharge, when the hearing has become considerably impaired.

No form of intratympanic resection [illegible] to be regarded as a safe procedure in scarlatinal otitis.

J. N. Roy[8] recommends the following procedure for dressing the wound made by the radical mastoid operation:—About the sixth day the gauze which was inserted at the time of operation is removed, and the wound cleansed with liquor hydrogenii peroxidi and carefully dried. Small strips of plain gauze, 1½ cm. wide by 6 cm. long, dipped in sterile liquid vaseline, are introduced into the wound, so that one end lies in the depth of the wound and the other just outside. The whole cavity is carefully carpeted with these strips, and then cotton-wool soaked in liquid vaseline is pressed into the wound fairly tightly. This toilet is repeated at first every day, subsequently, as the wound secretes less, every second day. It is claimed that this method is superior to that of packing tightly with various antiseptic gauzes, in that (1) It is much less painful; (2) The wound does not granulate so readily; (3) Epidermization proceeds rapidly; (4) The cavity retains, if so desired, the shape which it had immediately after operation.

Labyrinthine Suppuration.—An analytical account of thirty cases of labyrinthitis which have come under Messrs. West and Scott's[9] care during the past four years forms one of the most important papers which have been given during the year. Operative interference with the labyrinth is of comparatively recent date, the first case being reported by Jansen in 1807. In this country during the last four or five years attention has been specially drawn to the subject by Milligan and Whitehead.

Labyrinthitis may be (1) acute, (2) chronic, and either form may be diffuse or circumscribed; all forms arise much more frequently from chronic than acute middle-ear disease. The path of infection from the middle ear is usually through the outer labyrinth wall, the most vulnerable sites being the external semicircular canal and the region of the fenestra ovalis. Labyrinthine invasion is frequently associated with the presence of cholesteatoma in the middle ear. Vertigo, vomiting, tinnitus, deafness, pain and headache, of which the first two are the most constant, are the main symptoms of this condition; spontaneous nystagmus was not observed once. Certain tests are applied in suspected cases, such as:

1. Rombergism. Standing with eyes closed, on both feet together, or on one foot, the patient usually sways or falls to the affected side.

2. On attempting to walk straight forward, the patient will usually deviate to the affected side.

3. Execution of movements demanding precise co-ordinate control, as jumping or hopping with eyes open or closed.

4. Elicited nystagmus. The patient is seated on a revolving stool and turned around ten times, then stopped; normally one finds nystagmus present when looking away from the direction of the previous turning, absent when directed towards this. In cases of unilateral labyrinthine disease it was impossible to elicit nystagmus after rotation towards the affected side.

The indication for operation on the labyrinth is the diagnosis of infective labyrinthitis. This is made (1) From the presence of symptoms and the response to special tests; (2) From operative discoveries.

1. The most important symptom is vertigo, which is absent in only a small number of cases; its value is increased by association with vomiting, loud tinnitus, loss of bone conduction, local pain, and headache.

2. Many labyrinthine lesions are discovered during the course of the radical mastoid operation.

All cases where the vestibule or ampullary ends of the semicircular canals are involved should, in the author's opinion, be thoroughly opened up and drained. Where there is a small erosion into the external horizontal canal without labyrinthine symptoms, it is enough for the time being to curette away the softened bone. Operative

Fig. 28.—Inferior Vestibulotomy, with partial removal of Cochlea.

interference aims at opening up and draining the vestibule. The tympanic aspect of this cavity is crossed by the facial nerve, and drainage may be attempted either above or below the nerve. Superior vestibulotomy is performed by opening up along the external semicircular canal and its ampulla, and the ampullary end of the superior semicircular canal, and removing the roof of the vestibule. This procedure must be regarded as inadequate if carried no further.

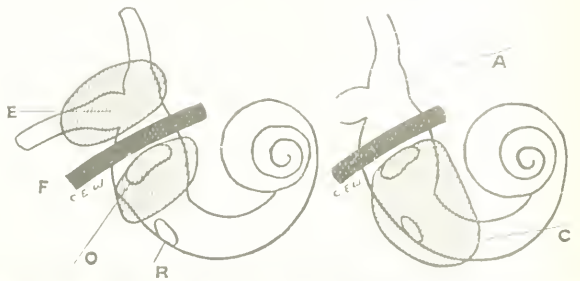
In inferior vestibulotomy (*Fig.* 28) that portion of the outer wall of the vestibule which extends from the upper border of the oval window to the upper border of the fossula rotunda is removed, and further, the outer wall of the first half turn of the cochlea may be taken away.

When the superior opening of the vestibule is indicated by the locality of the disease, this should be combined with inferior vestibulotomy.

This the writers term double vestibulotomy (Figs. 29, 30), and this may be extended by complete removal of the semicircular canals and cochlea, "extirpation" of the labyrinth an operation only called for by the most extensive disease.

The authors state that in all cases where vertigo or other labyrinthine

symptoms were present complete relief was given by the operation. There was no permanent case of facial paralysis. In one case only was it possible to ascribe a fatal result to the operation, and in this case superior vestibulotomy had been performed, a measure which the writers opine is too limited to provide adequate drainage.



Vestibulotomy.

E. Fa
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W. Milligan[10] contributes the following short paper on "The Surgical Treatment of Labyrinthine Suppuration":—

"The vast majority of cases of labyrinthine suppuration are secondary to chronic, more rarely acute, septic disease of the middle

SURGICAL TREATMENT OF LABYRINTHINE SUPPURATION.

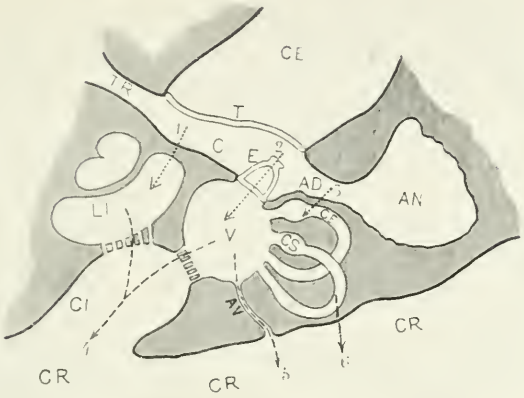

Fig. A.—Diagrammatic view (after Lermoyez) of the usual routes of septic infection from the middle to the internal ear (1, 2, 3), and from the internal ear to the interior of the cranium (4, 5, 6). CE, External meatus; T, Membrani tympani; AN, Mastoid antrum; LI, Cochlea; V, Vestibule; AV, Aqueductus vestibuli; CE, External semicircular canal; CS, Superior semicircular canal.

Fig. B.—Complete radical mastoid operation with view of outer labyrinthine wall. The horizontal, superior and posterior semicircular canals have been opened up to show their relative positions. The aqueductus Fallopii has also been freely opened up. A portion of the posterior (bony) meatal wall has been left intact.

SURGICAL TREATMENT OF LABYRINTHINE SUPPURATION

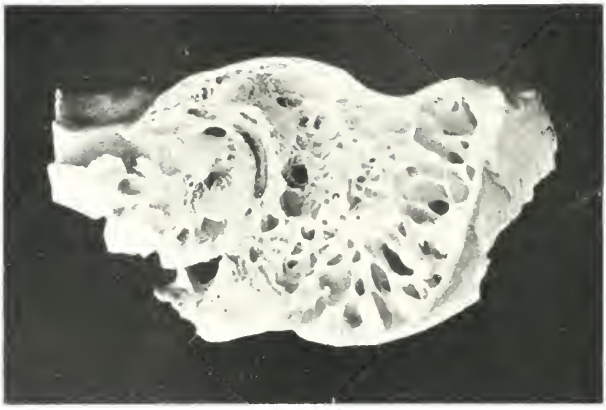

FIG. C.—Section of temporal bone to show the relative positions of the fenestra ovalis the Fallopian aqueduct, and the horizontal semicircular canal.

FIG. D.—The completed "bridge" operation.

ear. The most frequent paths of infection from the one cavity to the other are: (1) Through a fistulous tract in the external semicircular canal; (2) Through the fenestra ovalis; (3) Through the fenestra rotunda. In only from 1 to 2 per cent of cases of chronic septic otitis media does labyrinthine infection result. This no doubt is due to the denseness of the bone forming the labyrinthine capsule, and to the rigidity of the annular ligament and the membrana secundaria. Once septic infection has gained access to the internal ear there is nothing to prevent its passage to the base of the brain or to the surface of the cerebellum.

"The various paths along which pathogenic organisms travel brainwards are the perivascular sheaths of the auditory or facial nerves, the aqueductus vestibuli, and in exceptional cases by erosion of the superior semicircular canal. Another path of infection is at times possible, viz., by transference of organisms along Mouret's canal, a canal running from the posterior wall of the mastoid antrum through the pars petrosa and opening upon the posterior wall of the pyramid above the internal auditory meatus (*Plate XII, Fig. A*).

"Whatever means be adopted to open up the labyrinth, the first, and an essential, step is the performance of a 'complete radical mastoid operation,' with a free and generous removal of the facial spur (*Plate XII, Fig. B*). In this way the outer labyrinthine wall is brought fully into view, and under a powerful illuminant fistulous tracts are carefully looked for. A word of caution is necessary here, as it is very easy to mistake the opening of a minute bone-cell for the mouth of a fistulous tract. A very careful examination with a probe is essential under such circumstances.

"The main practical difficulties experienced in opening up the labyrinth are due to the anatomical disposition of the following structures:—the facial nerve, the internal carotid artery, the jugular bulb, and the superior petrosal sinus.

"If during the performance of the radical mastoid operation the facial spur be freely cut away, the position of the fenestra ovalis and the fenestra rotunda is readily demonstrated.

"The horizontal semicircular canal is invariably situated 3 mm. above the Fallopian aqueduct, and is usually separated from it by a small furrow in the bone. Occasionally, however, the one merges imperceptibly into the other. The general direction of the external canal is oblique, and not horizontal as its name would imply (*Plate XIII, Fig. C*). Its anterior arm is 5 mm. in length, and opens into the posterior wall of the vestibule by a dilated orifice. This opening is $1\frac{1}{2}$ mm. above the Fallopian aqueduct, or $4\frac{1}{2}$ mm. above the fenestra ovalis, and is found in a vertical line drawn through the posterior border of the oval window. The posterior branch opens also upon the posterior wall of the vestibule.

"The anterior branch is situated almost invariably above the facial nerve, but in a certain proportion of cases—estimated at about 12 per cent—it occupies a lower position and is crossed by the facial nerve.

"Various methods have been suggested for opening up the interior of the labyrinth. Jansen, to whom the credit of having first opened the labyrinth is due, performs a complete radical mastoid operation, and freely exposes the outer labyrinthine wall. The posterior branch of the external canal is located and opened. By working in a direction forwards and upwards, its anterior branch is followed into the vestibule. The opening thus made is carefully enlarged, care being taken to avoid wounding the Fallopian aqueduct which in normal cases is situated 1½ mm. below the ampullary orifice of the anterior branch of the external canal. In performing Jansen's operation care must also be taken to avoid injuring the dura mater and the superior petrosal sinus above and the jugular bulb below.

"Botey opens the vestibule by taking as his immediate landmark the anterior limb of the external canal, opening it and enlarging the opening thus made anteriorly and superiorly. Should the stapes happen to be still *in situ* he removes it; if not he opens the fenestra ovalis and cuts away the posterior portion of the pars promontoria between the two fenestræ. In this way an opening is made both in front of and behind the curve of the Fallopian aqueduct.

"Hinsberg, after a complete and radical mastoid operation opens the fenestra ovalis by the removal of the stapes if still present. The opened fenestra is carefully enlarged in an upward direction. A small stylet is then introduced into the vestibule as a guide, and the bony covering of the anterior limb of the external canal is cut away until the stylet is exposed to view.

"*The Bridge Operation.* The operation which I have performed in ten cases of severe labyrinthine suppuration, and which has given excellent results, is as follows:—A complete and radical mastoid operation is first performed, and in order to secure free access to the whole operation area the following method of making a flap from the soft parts is adopted:—A long knife is introduced into the meatus and made to cut vertically outwards along the line of junction between the superior and posterior cartilaginous walls of the meatus. The incision is carried well into the concha. The knife is now swept round in a circular direction parallel to the curve of the anti-helix to the floor of the meatus. The comparatively large flap thus secured is trimmed, and folded downwards and backwards on to the floor of the excavated mastoid process. The flap is kept in position by two silkworm strands passed first through the skin of the neck, then through the flap and back again to a point close to the original point of entry, and tied over a rubber tube. The petromastoid is now entered in the triangular space between the posterior limb of the external canal and descending limb of the posterior canal. This little triangle is situated 4 mm. behind the highest point of the extreme convexity of the descending portion of the Fallopian aqueduct.

"The opening thus made is enlarged upwards and backwards until the posterior canal is freely opened. By now working towards along

the external canal its anterior limb is opened, and by following this the vestibule is ultimately reached.

"A special 'facial protector' (*Fig.* 31) is now inserted and lies over the aqueduct in the form of a cap. The fenestra rotunda is then located, opened by means of a small bur, and the pars promontoria cut away in an upward direction until the fenestra ovalis is reached, the stapes being removed if still present. By means of a specially constructed bur cutting vertically, the bone lying immediately under the aqueduct is cut away, so that finally, when the facial protector is removed, the aqueduct appears like the arch of a bridge—end on as it were, and facing the operator—between the semicircular canal system behind and the cochlear system in front (*Plate XIII, Fig. D*).

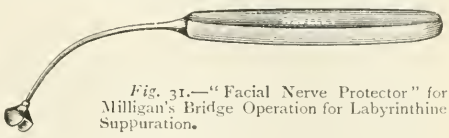

Fig. 31.—"Facial Nerve Protector" for Milligan's Bridge Operation for Labyrinthine Suppuration.

"Free drainage of the various segments of the internal ear is thus effected, whilst the cavity is allowed to granulate, and finally to obliterate itself.

"After the completion of the operation, and when the auricle has been put back into position (not necessarily sewn back), the edges of the incised concha are trimmed in such a way that when the finger is placed in the enlarged meatus its edge is found to be on the same level as the floor of the exenterated mastoid."

Otitic Meningitis.—The successful treatment of otitic meningitis is slowly but surely becoming an accomplished fact. In from 70 to 75 per cent of cases the route of infection is through the internal ear to the meninges in the posterior fossa, in 25 to 30 per cent through the roof of the middle ear or mastoid antrum to the middle fossa. The prognosis, although always serious, is more favourable in cases of middle fossa infection. An early diagnosis of meningitis is essential, and valuable information is furnished by the presence of Kernig's sign and by examination of cerebrospinal fluid obtained by means of lumbar puncture. The main indications, so far as treatment is concerned, are the free opening up of the area of infection and the provision of adequate drainage of the subarachnoid space. In a case of otitic meningitis successfully operated upon by C. E. West, trans-labyrinthine drainage was effected by means of a wire drain.

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ECZEMA. *E. Graham Little, M.D., F.R.C.P.*

Sutton[1] prefers **Crude Coal Tar** to the refined product in general use. It is applied undiluted on smooth pieces of cotton cloth (lint), which are fixed in position by bandages or plaster. It is especially useful in chronic recurrent forms of eczema in which the skin is dry and scaly,

with considerable papillary hypertrophy and but slight thickening of the outer layers of the epidermis. Improvement results within from twenty-four to seventy-two hours. If the reaction is too severe, zinc oil (zinc oxide 55, olive oil 40) to which carbolic acid (5 per cent) may be added if desired, should be used."

REFERENCE.—[1] *Amer. Jour. Med. Sci.* Aug. 10, 1908.

ELEPHANTIASIS. *J. W. W. Stephens, M.D.*

A. Castellani[1] has treated several cases of elephantiasis of the leg, especially those of long standing, with injections of **Fibrolysin** (Merck) and subsequent **Operation.** Fibrolysin is a combination of thiosiamine with sodium salicylate, and is soluble in water. Before making the injections the patient is kept in bed for a week; the affected parts are bandaged with flannel or india-rubber bandages, and are massaged twice daily. The result is that the parts become softer, and so the injections can be more readily made. Two cc. of fibrolysin are injected every day or every other day for about a month. The injections are then stopped, but the bandages are continued. After seven to ten days, thirty or more injections are again given. The parts are now much smaller, and the skin is soft and elastic, and can be pinched up in folds. To remove the superfluous skin which remains, the author has practised in some cases removal of long elliptical strips, and then bringing the edges together by sutures. After treatment, bandages should still be worn. In some cases the dimensions of the limb have been reduced by half, permitting of the patients walking, a feat almost impossible before the treatment.

C. R. Stevens[2] describes a case where he had dissected off a mass of elephantoid tissue from the leg and immediately skin-grafted the area, with encouraging result. (*See also* LYMPHATIC OBSTRUCTION.)

REFERENCES.—[1] *Jour. Cutan. Dis.* May, 1908; [2] *Ind. Med. Gaz.* June, 1908.

EMBOLISM AND THROMBOSIS OF THE MESENTERIC VESSELS.
Rutherford Morison, F.R.C.S.

J. M. Keegan[1] says that this is a disease of middle life, and is four times commoner in males than in females. It may run an acute, subacute, or chronic course. Prof. Cheyne,[2] in 1860, published a case where the specimen was taken from a female subject æt. 65, who suffered from an aneurysm of the abdominal aorta. The cœliac axis, and superior and inferior mesenteric arteries were completely obliterated near their origins and represented by fibrous cords; still all the branches of these vessels were filled with injection material. The stomach, liver, spleen, pancreas, and duodenum being supplied by the left lower intercostals and by the left renal and suprarenal arteries, the remainder of the intestine received its supply from a large plexus surrounding the rectum, except the cæcum and ascending colon, which received their blood supply from the last dorsal artery on the right side. The chief morbid conditions giving rise to mesenteric embolism are endocarditis with vegetations, atheroma of the aorta, and arteriosclerosis, while mesenteric thrombosis is usually the result of septic conditions within

the abdominal cavity, such as phlebitis of the mesenteric veins or of those of the lower extremity. Cohnheim has shown experimentally that the pathological results following embolism of either mesenteric artery are identical with those produced by thrombosis of the corresponding vein, and further, that simultaneous ligature of both artery and vein gives rise to exactly the same condition of the bowel as when the artery or vein is ligatured alone. In acute cases the symptoms at once suggest intestinal obstruction. There is a sudden intense abdominal pain—at first paroxysmal, later on continuous, vomiting,—and collapse. If the lesion is high up in the small intestine, blood is usually present in the vomit, and the motions are blood-stained; later, constipation sets in. The prognosis is always very bad. Jackson, after an examination of over two hundred cases, puts it at 94 per cent mortality. When once the diagnosis has been made, the abdomen should be opened and the diseased bowel resected. Keegan records two cases of his own: in the one a diagnosis of malignant growth of the bowel with localized peritonitis had been made; the other case was mistaken for intestinal obstruction. Both died.

REFERENCE.—[1]*S. African Med. Rec.* Ap. 25, 1908; [2]*Jour. Anat. Phys. Lond.* 1869.

EMPHYSEMA, OPERATIVE TREATMENT OF.

Joseph J. Perkins, M.A., M.B., F.R.C.P.

Operation in emphysema was proposed by Freund[1] as far back as 1858 on the basis of his observation that certain forms of the disease had their starting-point in alterations in the thoracic wall and not in the lung. The costal cartilages were primarily at fault, change in them leading to secondary changes in the lung. The alteration in the cartilages consisted in an enlargement and deformity, and a calcification which deprived them of their elasticity and made them rigid. As a result they thrust the ribs out and up, bringing them into the position they occupy in inspiration, and finally immobilizing the thorax in that shape, restricting the movement of the lungs and hampering their free play. The change can occur at all ages. Starting as a rule in the second and third right cartilages, it may spread till the whole thorax is involved, or may never advance beyond a local deformity. In old age the generalized change is the rule. Through the widening of the lower margin of the thorax, the dome of the diaphragm is flattened, and that muscle tends to degenerate and atrophy.

Let the cartilages be cut, and the thorax will regain its mobility. The operation has now been performed three times with excellent results, though the small interval that has elapsed warns us to speak with caution. In the first case, under Freund himself (1906), the patient, a man of 46, was suffering from an advanced degree of emphysema, which had resulted in cardiac dilatation and œdema. His condition was very serious. The thoracic excursus was only 2 cm., and the vital capacity 800 cc. Portions (1½ cm. in length) were removed from the second and third right cartilages, the attachments of the

pectoralis major having been thrown back. Later, portions of the second, third, and fourth cartilages on the left were removed in the same way, and in each case the ribs descended into the expiratory position and began to move. Improvement followed and the œdema diminished, the inspiratory excursus increasing to 5 cm. and the vital capacity to 1400 cc. As was to be expected in so advanced a case, the heart remained dilated.

In Mohr's case 1½ cm. of the second and third right cartilages were removed, the rib being encroached on. Relief for a time followed. The symptoms returning, portions of the third, fourth, and fifth right cartilages were removed. The ribs at once fell into their normal position, and the inspiratory excursus increased to 5 cm. Great relief was felt.

The third case was one of marked emphysema and dyspnœa, but without signs of cardiac failure and with no albuminuria. The respiratory excursus was 2 cm. Portions about 1½ cm. long were removed from the first, second, third, fourth, and fifth right costal cartilages. The respiratory excursus increased to 5 cm., the lung moved freely, and the man was able to resume his work.

No doubt, in the future the resection will be extended to include a larger number of the ribs, and the lower as well as the upper. Done early, the lung might regain its functions to a large extent. To what proportion of cases of emphysema it will be applicable remains for the future to decide.

Cohn[2] has recently published another successful case with an excellent result, though the emphysema was extreme and had led to marked troubles—cardiac, respiratory, and alimentary. Cohn would extend the operation to cases of emphysema other than the group indicated by Freund himself, where the rigidity and deformity of the thoracic wall is the primary factor.

REFERENCES.—[1]Lejars, *Sem. Méd.* Nov. 6, 1907; [2]*Deut. med. Woch.* Mar. 5, 1908.

EMPYEMA (Treatment by Aspiration Drainage).[1]

Joseph J. Perkins, M.A., M.B., F.R.C.P.

The imperfect results of treatment in dealing with long-standing empyemata, ending often only in the persistence of a huge suppurating cavity which needs an Estlander's operation to close it, show that some improvement in the method of simple drainage is called for. Bülau (1876) was apparently the first to recognize that the failure of the lung to expand was due to the fact that the two sets of forces acting on it—the one tending to draw it inwards, the other outwards, at length come into equilibrium. With a very slight difference in favour of the latter, the expansion of the lung would be resumed and the pleural cavity diminished if not obliterated. He proposed to reduce the intrapleural pressure or set up a decided negative pressure in the cavity of the pleura by *aspiration*. Perthes (1893) improved on Bülau's method by attaching a Bunsen's hydraulic pump to the

drainage tube. Such a procedure, however, necessitates confinement to bed, and is only applicable in certain places. Bryant simplified the method in such a way that it could be employed in any place, and did not prevent the patient taking exercise, by the happy idea of substituting a rubber bottle or small Politzer's bag for the elaborate pump. The bag is compressed, and in this state is attached to the drainage tube; its elastic recoil does the rest. The amount of negative pressure required to overcome the elastic tension of the lung is slight: any excess may aspirate blood from the pulmonary vessels and stain the discharge. The amount of pressure is easily regulated by the degree of compression of the bottle before it is attached. It is essential of course that the drainage wound and opening into the thorax shall be made air-tight. Schley uses a single drainage tube of 35 to 40 French calibre, and packs the opening about it with iodoform gauze, or wool saturated with boracic acid ointment. Over the tube is stretched a piece of dentist's rubber dam, four inches square, with a small hole cut in it and strapped firmly on to the chest wall. A circular wad of absorbent cotton is placed about the tube, and a binder put on. A glass connecting-piece and tube connect the rubber bag, which itself is fastened to the dressings and causes no inconvenience. Such a simple method has proved in Schley's hands perfectly satisfactory, and has prevented leakage, sometimes for two weeks without renewal. As a rule, he changes the dressing weekly.

He reports eight instances of very satisfactory results by this method, one of which is worth quoting. The patient was a boy, æt. 15. Three years before admission he suffered from an empyema, for which an insufficient operation was done. When seen, there was a small sinus leading into a cavity in the pleura which admitted a probe in all directions for five and a half inches. There was foul, copious expectoration of the same nature as the sinus discharge. The opening was enlarged and free drainage established; ten days later aspiration was employed. In five weeks the cavity had narrowed to a sinus, admitting a 15 French catheter, and aspiration was discontinued. Two months from its commencement everything was completely healed.

REFERENCE.—[1]W. S. Schley, *Amer. Jour. Med. Sci.* Jan. 1908.

ENDOMETRITIS.

(*Vol.* 1890, p. 515; 1891, p. 483; 1892, p. 224)—Chronic cervical endometritis, and sterility consequent upon it, can sometimes be cured by painting the cervical canal with **Perchloride of Iron** 1 part, glycerin 3 parts. Ten-per-cent solutions of **Zinc Chloride** are also recommended for the same purpose. Lawson Tait applied the **Paquelin Cautery** to the interior of the uterus after dilatation of the cervix, in obstinate cases.

ENTERIC FEVER. (*See* TYPHOID FEVER.)

ENTEROPTOSIS. *Rutherford Morison, F.R.C.S.*

John Clark[1] considers X rays the most valuable method by which to determine with accuracy the degree of enteroptosis. He groups the varieties of ptosis into: (1) The cases of congenital habitus in

which surgical treatment is not advised. (2) Cases acquired from natural causes occurring in women who have borne children without proper obstetrical care and puerperal supervision. The pelvic viscera drop into a vicious ptosis due to the failure to repair the pelvic diaphragm and the inefficient return of the abdominal wall to its normal tonicity. Under these conditions the abdominal viscera lose their ventral support and tend to sag. These cases, if treated surgically when in an early stage, give most satisfactory results. (3) Acquired cases from post-operative adhesions, in hernia, or following the removal of large tumours. The operations he advises are: Webster's, which consists in taking up a relaxed abdominal wall by bringing into apposition the recti muscles and thus overcoming any further tendency to a diastasis, which, in a sense, permits of a variety of large ventral hernia; and suspension of the sigmoid in cases of great redundancy, and the suspension of the transverse colon by omentoventral suture.

The conclusions drawn from experience are: (1) No cases of enteroptosis should be operated upon until medical and mechanical means have been exhausted without relief. (2) Cases of ptosis due to congenital habitus will not be relieved by operation. (3) To arrive at an accurate estimate of the degree of ptosis, the X rays should be employed. (4) In cases following child-birth where the abdominal wall is very lax, thus destroying the equilibrium between the extra- and intra-abdominal force, resection of the relaxed ventral tissue through the method suggested by Webster may give perfect relief. (5) In simple gastroptosis without marked participation of the colon, the Beyea operation may be the one of preference. (6) In exaggerated cases of ptosis of the transverse colon, where a pendulous loop is formed which produces stasis of a fæcal current, as well as tending to twist upon itself with symptoms of partial obstruction, nothing less than excision of the redundant loop with end to end anastomosis will effect a cure. (7) In cases of redundant sigmoid associated with pain and constipation, a suspension of the sigmoid, so as to pull it up out of its bad position in the pelvis, may give entire relief. In cases of exaggerated redundant sigmoid attended with extreme constipation verging on obstruction, a resection may be advisable. In all cases a carefully fitted abdominal support, or carefully adjusted straight front corset, should be worn after operation, in order to give as much artificial support as possible.

REFERENCE.—[illegible] *Surg. Gyn. and Obst.* Apr. 1909.

ENURESIS, NOCTURNAL.

[illegible] Guthrie *Index of Treatment* finds Hyoscyamus [illegible] Citrate of Potash and Infusion of Buchu [illegible] than belladonna. [illegible] and [illegible]: R Tinct. Hyoscyami ℥j, Potass. Citrat. gr. xv, Inf. Buchu ad ℥ss: [illegible] daily.

EPILEPSY.

[illegible] 1892, i. 220: 1897, pp. 6, 202.—In cases where [illegible] treatment has failed itself, it may succeed in inducing improvement [illegible] Antipyrin. Bromelone, given in 5-gr. doses thrice daily, has been successful. Bromide [illegible] of every kind act more effectively in combination with [illegible] from which purins have been eliminated, and in which salt is reduced to a minimum.

EPITHELIOMA. *E. Graham Little, M.D., F.R.C.P.*

Bulkley[1] gives an analysis of 417 private cases, the subjects of epithelioma; 274 of the total number were males, 143 females, the preponderance in males being ascribed to the irritations of smoking and shaving. The distribution as regards age shows a surprising constancy in each quinquennium between thirty and seventy; in advancing years it is more common in males. As regards position, the commonest site was the nose (128 cases), the cheek coming next in frequency (94 cases), and then the lower lip (32 cases, all in males). The series includes eight cases of Paget's disease, all in females. Multiple epitheliomata were noted in twenty-six cases. The duration of the malignant process before being treated varied greatly: in forty-seven cases it was under six months; in forty-three cases it had persisted for from fifteen to twenty years. Treatment consisted in: (1) Excision; (2) Application of caustics, such as the arsenical paste of Marsden; (3) Curetting, and subsequent filling of the cavity made by the curette with powdered pyrogallic acid; (4) X rays; (5) Radium, which was not very successful, and consequently the first four methods alone are recommended. In the pre-cancerous stages where there is continued irritation and superficial epithelial derangement, constant application of ointments containing salicylic acid, ichthyol, pyrogallic acid, etc., may result in warding off epithelioma.

Reference.—[1]*Med. Rec.* Mar. 21, 1908.

ERUCTATIONS, NERVOUS.

(Vol. 1904, p. 370)—As this is usually the consequence of air-swallowing—a neurotic symptom—it should be treated by prevention of the act of swallowing air and by correction of the general state of the nervous system. Gastric sedatives are to be deprecated.

ERYSIPELAS. *E. Graham Little, M.D., F.R.C.P.*

A saturated solution of **Magnesium Sulphate** was used with satisfactory results in the treatment of erysipelas in fifty-four cases by Tucker.[1] The method of use is as follows: The solution is applied in facial erysipelas by means of a mask composed of fifteen to twenty thicknesses of ordinary gauze soaked in the solution, the covering extending beyond the margin of the disease, the eyes being covered, and the mouth and nose left free. Oil-silk is spread over the dressing, and this is impregnated anew with the solution as often as it becomes dry—usually once in two hours. The dressing should not be removed oftener than every twelve hours, and the infected area should not be washed while the treatment is employed. Relief was usually experienced within twenty-four hours, and the symptoms subsided within three days, even in cases complicated by constitutional disease. No internal medication was used concurrently; the diet was confined to milk until the temperature was normal.

Carbolic Collodion[2] in the following formula may be painted on the affected parts and for about two fingers' breadth beyond:—

℞ Acid. Carbol. 6 | Collodii 100

This should be painted on twice a day and the following internal medication followed :—

℞ Camph. | Acid. Benz. āā 15

In capsules, to be taken every two hours.

Allen[3] uses as a routine treatment the following method. The affected part is painted over with pure carbolic acid for an area ½ in. beyond the line of demarcation ; when the whitening effect of the carbolic acid is noted, it is washed off with 95 per cent alcohol. If burning is experienced, a cloth saturated with alcohol may be left on the part. One application usually suffices, and it was never necessary to make more than two. Desquamation usually begins on the fourth day, and the skin heals without scar.

Tyrrell Gray[4] considers local applications of secondary importance, and uses by preference **Metchnikoff's Serum**, combined with internal administration of quinine and stimulants. Daily injections of 40 to 50 min. of serum were given in the case of six children treated in the wards of the Great Ormond Street Hospital with remarkably uniform results in bringing down temperature and ameliorating symptoms. Antistreptococcal serum did not seem to have as good an effect in one case in which it was first tried, and Metchnikoff's serum was substituted for it, with the apparent result of immediate relief. The injections should be given until the temperature falls. Local measures were confined to dusting the parts with a powder consisting of equal parts of calomel, zinc oxide, and starch.

Duncan and Illman[5] report three cases in which erysipelas was treated by the injection of **Dead Streptococci** with encouraging results.

References.—[1]*Therap. Gaz.* June 15, 1908 ; [2]*Münch. Med. Woch.* Mar. 10, 1908 ; [3]*N. Y. Med. Jour.* July 11, 1908 ; [4]*Lancet*, Aug. 1, 1908 ; [5]*N. Y. Med. Jour.* Sept. 19, 1908.

ERYTHEMA IRIS. *E. Graham Little, M.D., F.R.C.P.*

Allan[1] reports an unusually successful result of treatment with **Picric Acid** in a severe case. The patient, a lady aged 31, had a similar but less severe attack twelve months previously. About the fourth day of the disease she complained of pains like that of a burn, a description which suggested the use of a 1 per cent solution of picric acid on wool, which was applied twice a day with complete relief of the pain and ultimate healing. It is recommended to smear the fingers of the operator with vaseline before using the picric acid, to avoid the consequent staining.

Reference:—[1]*Lancet*, July 25, 1908.

ERYTHEMA NODOSUM.

[1]*Ibid.* 1886, p. 240.—Order Rest in Bed ; paint the nodes with flexile **Collodion**, and administer **Salicin**. [2]Calamine, oxide of zinc, glycerin, of each 1 dr., lime-water 1½ oz., constitutes a useful sedative application).

EXOPHTHALMIC GOITRE. (*See* Goitre.)

DIAPHANOSCOPY OF THE EYE.

Fig. A. Medium pigmented brown iris. Eserin myosis.

Fig. B. Lightly pigmented blue iris.

Fig. C. Iritic synechiæ. Pigment deposits on capsule and dehiscences.

Fig D. Syphilitic iritis and gummata.

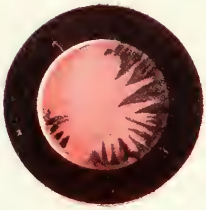


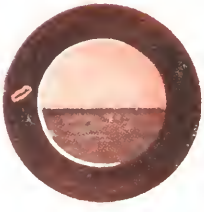
Fig. E. — Partial cortical cataract.

Fig. F. — Lamellar cataract.

Fig. G. — Anterior capsular cataract.

Fig. H. — Total opacity of lens, showing nucleus and sectors.

OPHTHALMOSCOPY OF THE EYE



EYE (Diagnostic Methods). *Ernest E. Maddox, M.D., F.R.C.S.*

Diaphanoscopy.—The transmission of light through the sclerotic into the vitreous chamber by a glass rod pressed against the eyeball, and provided at the other end with a small electric lamp screened in every other direction, is of great value in the differential diagnosis between intra-ocular tumour and simple detachment of the retina. Numerous instruments have been devised for the purpose, and one of the later ones by Würdemann, shown in *Fig.* 32, is perhaps the most convenient. By his courtesy some of the effects produced

Fig. 32.—Würdemann's Diaphanoscope.

thereby are illustrated in *Plates XIV* and *XV*. Würdemann has shown that the circumlental space can be made visible also, as shown in *Fig.* 33, where the clear ring just inside the broad outer dark ring represents the circumlental space, between the dark ciliary processes, and the edge of the lens. This space is said to vary in width from 1 to 3 mm., and may be lessened or entirely obliterated in glaucoma. In practice it is best observed on the opposite side from that to which the tip of the diaphanoscope is applied. The circumlental space is seen by Würdemann to be enlarged during accommodation. When the tip of the instrument is placed over the situation of a choroidal tumour, the pupil ceases to be illuminated, its red glow returning as soon as the instrument is moved beyond the border of the tumour. V. Reuss showed that when a beam of light is passed sideways through the eye, as by withdrawing the diaphanoscope somewhat, or even by concentrating a beam of light on the sclera with a convex lens, an intra-ocular tumour in the anterior half of the eye casts a shadow on the opposite half of the sclera.

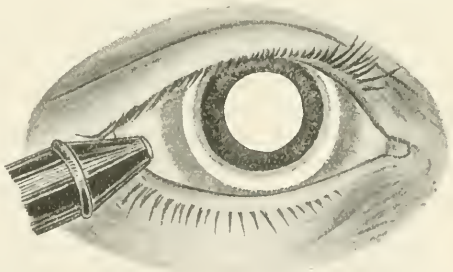


Fig. 33.—The Diaphanoscope causes the circumlental space to appear as a clear ring.

Sachs has also used his diaphanoscope for examination of the eye by the direct method with the ophthalmoscope, without using the mirror of the latter, with a view to detect choroidal detachment or to see the ciliary processes. The present reviewer has found diaphanoscopy highly serviceable in some cases of choroidal tumour, and especially in one of black cataract, the pigmentation of which was so deep that nothing

but an absolutely black reflex was obtainable in response to the most brilliant ophthalmoscopic illumination. There had been a history of intra-ocular hæmorrhage, and more than one surgeon had declined to perform an operation from the doubtful nature of the case, suspecting detachment of the retina. Transillumination through the sclera showed a perfect circumlental space, proving that a black lens was the only cause of the absence of any reflex, and extraction of the lens followed with every satisfaction.

Nicotine Test.—The well-known defect in the fields of vision which is distinctive of nicotine poisoning first takes the shape of an oval colour scotoma extending from the optic disc to the macula. Within this area greens and reds appear less vivid, until finally the perception of these colours is lost there. The usual way of making the test is to move a small coloured object first to one side and then to the other of the fixation point, but the idea occurred some years ago, and was communicated to others, and has lately been independently noted by Holth [1] that this consecutive contrast of colours cannot be estimated quite so delicately as if the contrast were observed simultaneously, as in the design shown on *Plate XVI.* since the former test demands colour memory as well as colour perception. To place the diagnosis beyond all doubt, it is advisable to map out the papillomacular scotoma, and to establish the absence of any retinal changes visible to the ophthalmoscope other than pallor of the outer side of the optic disc and narrowing of the vessels. It must not be forgotten, however, that tobacco amblyopia sometimes complicates choroido-retinal changes, and the writer has known great improvement of vision to follow when the tobacco element was discovered and treated in cases considered incurable because of the apparent changes in the retina. Another well-known symptom of tobacco amblyopia is the confusion of sight occasioned by bright sunshine, so that its subjects say that they see better in the evening than during the day. The pupils are apt to be small in the early stages, but this is too uncertain a symptom to rely upon.

(For treatment, see Optic Nerve Diseases of.)

Detection of Squint.—The medical adviser of a family is not infrequently appealed to as to whether or not a child squints. To solve this problem is not so easy as at first sight appears, for a very strong appearance of squint may be present in eyes perfectly free from that defect. Short sight is the chief cause of this illusion in older children, while an "epicanthus," or an unfamiliar disposition of the eyelids, generally accounts for it in earlier life. To judge by the naked eye alone, therefore, is to run the risk of making a rash diagnosis. Such simple aids as the following are invaluable for their purpose.

Hirschberg's procedure consists in holding a lighted match or candle anywhere in a line between the root of the observer's and that of the child's nose, bidding the latter look at the flame. A minute but brilliant reflection of the flame from each cornea will be visible and, if the eyes be straight, these reflections will occupy symmetrical

PLATE XVI

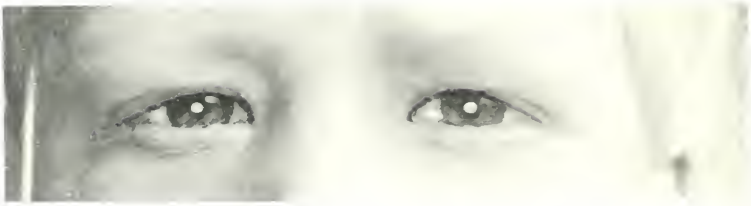
TEST FOR EARLY TOBACCO AMBLYOPIA.

Directions for Use.

Close one eye and look steadfastly with the other at the black diamond, so as to compare the intensity of the two greens, without allowing the eye to wander to either side of the diamond. Now repeat the observation with the other eye. If in each case the green on the same side as the fixing eye appears enfeebled or washed out, tobacco amblyopia is so presumably present as to indicate the desirability of complete examination of the colour scotoma and the retina to confirm it.

This test should be held at arm's length from the eye, and it is a good plan to cover the greens with two fingers while directing the patient's attention to the diamond, and warning against letting his eye wander therefrom; then withdraw the fingers simultaneously.

THE DETECTION OF SQUINT



positions in the two corneæ. Priestley Smith suggested the use of an ophthalmoscope. Quite as good as either will be found any lady's hand mirror, such as is obtainable in nearly every house, or even a sheet of writing paper with a hole cut in its centre. With the two last the child should be placed in the window with its back to the light. The mirror should be held below the observer's right eye, so as to reflect the skylight into the eyes of the child from a distance of two or three feet, while the attention of the latter is drawn to the observing eye of the surgeon, whose left eye remains closed. In using the sheet of paper the surgeon's eye should look through the hole in the centre and the child's attention be directed to the same hole. By whichever of these ways corneal reflections are produced, they will appear symmetrical in the two eyes if no squint be present. This is shown in *Plate XVII, Fig. A*, where the reflections are produced from the writer's squint camera, a diagram of which is shown in *Fig.* 34. It will be observed that the reflection in each eye is not precisely in the centre of the cornea, but lies a little to its nasal side, this being the physiological disposition, owing to the fact that the visual axis does not traverse the centre of the cornea in emmetropic eyes. In myopic eyes, however, it approximates more closely to the centre. This enables the character of any pseudo-squint due to myopia to be confirmed. We are so accustomed to see the two corneæ face a little outwards, i.e., away from each other, in ordinary eyes, that we miss it at once when they look straight forward as in myopia, and falsely interpret the latter condition as one of slight convergent squint.

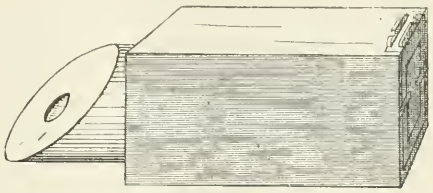


Fig. 34.—Squint Camera, fitted with inclined perforated mirror, the ellipticity of which is so planned as to throw a circular reflection on the cornea.

In a true squint the faulty eye will be at once detected by the abnormal position of its corneal reflection, as illustrated in *Fig. B* of the same plate, which shows the right eye squinting inwards. In *Fig. C* is shown a divergent squint of the left eye, the reflection lying much too near the inner edge of the cornea, while the right eye shows the physiological position of the image, only slightly to the inner side of the corneal centre. *Fig. D* is from the same patient as *Fig. A*, and is of interest as showing how an eye may be straight one moment and squinting the next. It was a case of "occasional squint," caught in the act by the camera. In *Fig. D* the reflection is seen to be a little to the outer side of the centre of the right cornea.

So deceptive is the appearance of pseudo-squint in some cases that parents are half inclined to believe their own eyes rather than to accept any assurance to the contrary. It may therefore become desirable to furnish positive proof, and for this nothing answers better than to take a photograph. This can be done, with even the simplest ordinary

camera, in a way which demonstrates the character of the illusion, and preserves it in a permanent form. All that I find necessary is to affix to the front of the camera a disc of white paper with a hole in its centre applied over the lens. If a fixed camera is used, such as a No. 1 Brownie for example, it is necessary to fix over this hole a supplementary lens, the focal length of which agrees with the distance of the patient. Thus at 10 inches a 4 D lens would be necessary, at 20 inches a 2 D lens, and so on. It is quite easy to affix a lens from the trial case with a little wax. The photograph is best taken out of doors, and the result will resemble those which are here reproduced, except that the reflection will not be so bright as with a camera fitted with an oblique elliptical perforated mirror to catch the skylight.

REFERENCE.—[1] *Ann. d'Oculistique*, Sept. 1908.

EYE INJURIES. *Ernest E. Maddox, M.D. F.R.C.S.*

Rupture of the Pectinate Ligament.—Leslie Buchanan[1] calls further attention to this important result of a blow upon the eye with a blunt object. The pectinate ligament proceeds from the posterior layers of the cornea at its periphery, to form the tendon of origin of the ciliary muscle. The external surface of the ciliary body glides against the inner surface of the sclera, so that when its tendon is ruptured there is nothing to keep it from falling back into the vitreous, or at least being drawn back between the sclera and the vitreous by its own elasticity and that of the choroid. Rupture of the ligament generally tears open the canal of Schlemm, and by obliteration of that channel produces glaucoma. The diagnosis is made from the uneven depth of the anterior chamber and the displacement of the pupil towards the side of the lesion, unless indeed the root of the iris itself is also torn away from the ciliary body (iridodialysis). The lens is dislocated by laceration of its ligament, and the ciliary body tends thereafter to become atrophic. No surgical attempt has yet been made to reattach the tendon.

Lange[2] not only approves the usual habit of carefully examining the tear passages in all traumatisms of the eye, recommending their careful and thorough injection and sounding if any discharge be present, but further advocates **Extirpation of the Lacrymal Sac** if the discharge be chronic. Failing this, the puncta should be touched with a **Galvanocautery,** or the **Canaliculi ligatured.** In *scratches of the cornea*, as with the nail of a finger, when they present the symptoms of returning acute nocturnal pain, Lange states that a 2 per cent solution of **Nitrate of Silver** is more effective in relieving the pain than cocaine.

Darier[3] recommends subconjunctival injections of **Sterilized Air** for traumatic keratalgia.

Foreign Bodies in the Cornea.—Dutoit [4] Switzerland points out that the devitalizing effect on the cornea of the **Cocaine** often so freely used for the comfortable extraction of foreign bodies delays healing of the resulting ulcer, and indicates that no unnecessary quantity

should be used, and that the extraction should be followed by very free washing out of the conjunctival sac with a simple lotion to get rid of superfluous cocaine.

Snell,[5] of Rochester, N.Y., has introduced a very convenient spud for the removal of foreign bodies from the cornea. The handle is furnished with a tiny electric lamp, casting its light upon the tip of the instrument. By a chuck mechanism, different spuds can be inserted in the handle.

References.—[1]*Ophthalmoscope*, Nov. 1907, p. 620; [2]*Ibid.* Feb. 1908, p. 146; [3]*La Clin. Ophthalmologique*, Oct. 1908; [4]*Sem. Méd.* June 24, 1908; [5]*Ophthalmology*, July, 1908.

EYE (Therapeutics of). *Ernest E. Maddox, M.D., F.R.C.S.* Murray M'Farlane,[1] Toronto, recommends for cleansing conjunctivæ affected by hypersecretion, a *collyrium containing the same salts as the blood* and of the same cryoscopic index, since such a fluid keeps the balance between exosmosis and endosmosis, and is unirritating. The cryoscopic index should be about 0·78. It resembles the salt introduced by Pochl[2] several years ago. Tablets made by Parke, Davis & Co. offer a convenient mode of effecting the solution. One tablet should be dissolved in 2 oz. of distilled water. The same solution is useful for injecting into the lacrymal sac, also for certain subconjunctival injections.

Too little attention, it may be said, has been paid to the cryoscopic study of eyewashes, and this introduction to it will no doubt lead to fuller investigations. The smarting sensation induced by the instillation of aqua pura within the eyelids is due to its hypotonic character, and we are all familiar with the immensely more soothing effect of boracic lotion. This is due less to the qualities of boracic acid (though these are without doubt somewhat soothing in most eyes) than to the increased sp. gr. of the solution. It must not be supposed that boracic lotion is inert. The fact that it can powerfully irritate the eyelids of certain persons with special idiosyncrasies, is in favour of its possessing a definite activity in the opposite direction with ordinary eyes, and experience amply confirms this. It is doubtful whether imitations of the blood plasma possess much advantage, if any, over properly proportioned boracic lotion in the ordinary forms of conjunctivitis. Collyria which exhibit too great a departure from orthotonicity tend to devitalize the epithelium. This is generally forgotten in prescribing lotions which are impregnated only by minute doses of powerful reagents, and it has long been the reviewer's custom to add to such collyria either boracic acid, or other indifferent salt, in sufficient proportion to secure approximate orthotonicity, and it is easy to secure the degree of hypotone or hypertone most appropriate to the end in view.

Cantonnet[3] suggests that eyewashes should be made isotonic with the tears, i.e., with a 1·4 per cent saline solution, and equivalent to boracic lotion of 2·5 per cent. With this recommendation the reviewer does

not agree, as the tears are distinctly irritative to the eye, in excess, probably because they are so hypertonic. It is interesting to observe that the strengths of boracic lotion to which we have all been led by clinical experience are such as to constitute a solution nearly isotonic with the blood, not with the tears.

Hyoscine and Scopolamine. These interesting alkaloids have for many years been considered by most chemists to be identical in every way. Wendell Reber,[4] a well known ophthalmic surgeon in Philadelphia, finds that physiologically their action on the ciliary muscle differs greatly. Solutions of equal strength ($\frac{1}{10}$ per cent) and of equal chemical purity, with a similar rotatory power of 20 as tested by the polariscope, begin to dilate the pupil in ten minutes, and cause maximum dilatation rather sooner in the case of hyoscine than that of scopolamine, thirty-five minutes as compared with forty-seven, this being obtained more rapidly in females than in males. It is with the ciliary muscle, however, that the difference is seen to be most marked, full cycloplegia under hyoscine being effected in an hour and under scopolamine in an hour and a half. In prescribing either alkaloid, it is well to specify that they should have a rotary power of 20, since inferior qualities are thus detected.

Lipogenin.—Agabavoff[5] recommends this liquid, which is colourless, transparent, neutral, and stable, as the best solvent of the alkaloids employed in ophthalmic therapeutics, and as being superior to the olive oil recommended by Panas. It dissolves iodoform, and is said to rob it of its odour at the same time. This solution makes an excellent dressing after plastic operations on the eye, since it does not dry or adhere to the wound. Its introducer soaks a disc of sterile gauze with it, this being covered by waxed paper under a layer of cotton and a bandage. It is a mixture of the ethers of palmitic and isooleic acid, and is also obtainable in a crystallized form.

Rabbits' Bile has been employed for keratitis and conjunctivitis of pneumococcal origin. Its bacteriolytic action on the pneumococcus is more active than that of the bile from man, dog, rat, or goat. It was introduced by Neufeld. Its application unfortunately entails a considerable amount of smarting pain, which lasts from one to several hours. Cases that have benefited are related by Morax.[6]

Deutschmann's Serum[7] is obtained from yeast-fed rabbits, and is said by its introducer to be superior to yeast for increasing the resistance of the body to microbic infection. Its efficacy is, however, somewhat doubted by many, and it is credited with absorbing opacities and exudates, more than with being actively antitoxic.

Darier[8] reports the cure of streptococcus and gonococcus infections by the injection of **Antidiphtheritic Serum**, and Fromaget[9] also has employed it for pneumococcic infections of the cornea. One brilliant case of cure simulated diphtheritic conjunctivitis, but pneumococcus was discovered to be the offender (*vide* CONJUNCTIVA).

Segelken[10] recommends extension of the now well-known **Morphia-Scopolamine Narcosis** to ophthalmic surgery. The preparation he

uses is supplied by Riedel, of Berlin, under the name of **Scopomorphin,** in sterilized ampoules. Each of these contains :—

℞ Scopolamine Hydrobromide gr $\frac{1}{50}$ Morphia Hydrochloride gr ½
Distilled Water ℥xxx

Three hours before operation, one-third of this solution is injected, after a quantity of fluid has been imbibed ; an hour and a half later, one-third more. It is rarely necessary to inject the remaining third, since the second injection nearly always converts the drowsiness from the first into sound sleep. As soon as the sleep appears deep enough, cocaine is instilled and the operation proceeded with. The patient sleeps during the operation and for several hours after. There is generally no subsequent vomiting. This anæsthetic is worthy of trial in cases of acute glaucoma unsuitable for chloroform, but it is not wholly free from danger, especially in old people.

Thyroid Extract has been employed by Richardson Cross and Herbert Fisher for *optic atrophy* resulting from hypertrophy of the pituitary body, and in each case with marked success. Fisher's theory is that administration of thyroid products will supply the economy with something which the pituitary gland, by excessive efforts, is endeavouring to provide.

Jequiritine in gelatine discs, applied to *epithelioma of the eyelids* of slow development, has produced good results, according to Rampoldi, and **Potassium Chlorate** has been recommended by Zentmeyer[11] for the same disease. The salt itself was thoroughly rubbed by him on to the floor and edges of the ulceration, first freed and dried from secretion. To begin with, the application was made daily, and later, every other day. Definite improvement ensued at the end of the first week, the result being excellent. As Stephenson[12] reminds us, Bergeon long ago used a saturated solution of the same salt for rodent ulcer.

Cosmettatos[13] reports well of **Römer's Jequiritol** (which is a preparation of abrine, the active principle of jequiritine) for the treatment of *pannus and corneal opacity* from chronic trachoma. The jequiritol is supplied in four strengths, and Cosmettatos begins with one drop of the weakest, increasing by one additional drop every day up to four. He then goes through the same routine with each successive strength. Inflammation generally begins while using solution No. 3, and the instillation is discontinued as soon as it reaches the desired height. Should it become excessive, the pain and inflammation can be reduced by the use of **Jequiritol Serum,** which we owe also to Römer, and which is prepared by immunizing animals with abrine. In one case only out of a considerable number was Cosmettatos obliged to use it.

Picric Acid for *chemical burns of conjunctiva and cornea,* especially by lime, is commended by Fortunati[14] in the form of a 2 per cent ointment. The best results are obtained when it is applied from the very beginning, as soon as the eye has been carefully cleansed, and before the supervention of ulceration and of secondary infection. It

should be applied twice or thrice a day after the instillation of cocaine to mitigate the smarting.

Ammonium Chloride is advocated by Pick[15] as a means of clearing up *corneal opacities* of old standing when the eye is quiet, the eye being bathed with a solution of 1 to 3 dr. in a cupful of boiling water. The same salt has been found by Guillery[15] to favour solution of the albuminate of calcium, to the deposition of which in lime-burns the corneal opacity is largely due.

Bishop Harman[16] makes the interesting observation with respect to **Nitrate of Silver,** that the addition of 15 per cent of pure glycerin reduces the smarting which attends its application to the conjunctiva. He thinks, too, that the glycerin would increase the penetrating action of the silver. The reviewer is inclined to think that the outward flow of serum from the tissues induced by the hydrophil properties of the glycerin, which not only slightly dilutes but neutralizes the nitrate of silver by means of the chlorides it contains, may afford an explanation of the lessening of pain. Glycerin also would at once favour the more intimate mixture of the tears with the solution of the drug, and thus neutralize it more quickly. If glycerin were first of all allowed to soak into the lids by the previous use of a solution thereof, it would theoretically increase the penetrative action of the nitrate of silver solution. Its addition, however, to the solution itself would appear to be likely to lessen its penetrative effect, and thus mitigate the pain.

Injections of **Alcohol** have been used for *blepharospasm* by Valude,[17] 1 cc. or 1·5 cc. of 80 per cent alcohol being injected, with a little added cocaine or stovaine. Three cases were cured. He had previously reported the instantaneous cure of two cases of *facial spasm* by injections of the same remedy over the stylomastoid foramen, the treatment being followed as usual by temporary facial paralysis. Other writers report successful cases, though Beltremieux[18] maintains that at best this "chemical resection" of the nerve, as he calls it, only cause an amelioration lasting on an average ten months.

Sodium Salicylate in massive doses appears to have been very effective when used in cases of *sympathetic ophthalmitis*. Lindahl[17] and Widmark[18] prefer it, in doses of four to six grams daily, to mercurial inunctions.

Galezowski[19] appears to be well pleased with the results he obtained with **Thiosinamine,** applied locally in solutions of 5 per cent to 15 per cent to *corneal nebulæ*, with an equal quantity of antipyrin, as suggested by Horeaux and Michel. An eye-bath, for five minutes at a time, was employed once or twice a day. Should too much hyperæmia of the eye be occasioned, the baths must be discontinued for some days, and if any pain be experienced during their use it may be anticipated by a few drops of cocaine. The treatment does not seem to remove leucomata so much as to make them more translucent. In six cases only out of twenty-six was there no improvement, and in

nine the improvement was marked. The first to employ thiosinamine treatment for corneal nebulæ was Suker.

Guillery[20] has shown that the diminution of vitality of the corneal epithelium favours the diffusion of liquids into the cornea, so that the preliminary use of cocaine may be a positive gain in the local thiosinamine treatment. The intramuscular injection of **Fibrolysin** has also been commended by Domenico[21] in corneal leucomata and exudative choroiditis, while Pick[22] and Windmuller[23] have employed it by local instillation for the same purpose, and report good results. It must be confessed, however, that the improvement is generally so slight as to be disappointing.

Atoxyl[24] seems to have given good results with *interstitial keratitis* due to inherited syphilis in the hands of Sydney Stephenson, though some others do not speak so well of it. He injects from 0·25 to 0·50 gram beneath the muscles of the buttock, once, twice, or oftener in the week, in many instances giving mercury with chalk 1 gr., three times a day, as well. The rather dangerous nature of this drug, however, as shown by Koch, who observed twenty-two cases of blindness without ophthalmoscopic signs, after injections of 1 gram for the cure of sleeping sickness, and by Kopke, who noted twenty-nine cases of bilateral optic atrophy, as quoted by Morax[25] and Stephenson, indicates that it may be wise to use this treatment as a reserve in our armoury for specially difficult cases only.

Subconjunctival injections have not evoked much enthusiasm in this country, though in well-selected cases they have a measure of value. Darier,[26] their foremost advocate on the Continent, thinks very highly of the injection of 2 per cent solutions of **Cacodylate of Guaiacol** in all *tuberculous affections* of the eye, so much so, indeed, as to consider the measure as a diagnostic one from the reaction of healing, just as with tuberculin there is the reaction of aggravation.

For affections of the eye which used to be classified as *strumous*, and not frankly tubercular, such for example as phlyctenular keratitis, strumous pannus, etc., he favours Costa's injections of **Sterilized Air**, as also does Fränkel,[27] who includes *corneal ulcers* and all superficial forms of keratitis. Fränkel is doubtful, however, whether this treatment effects much more than to lessen the painful symptoms, the photophobia, lacrymation, and blepharospasm. Trachomatous pannus and syphilitic keratitis are not suited for this treatment. Interstitial keratitis of tuberculous origin, on the other hand, as well as *tuberculous episcleritis* and *sclerosing keratitis*, respond well to it. In *traumatic painful affections of the cornea*, subconjunctival injections of air twice a week are said to relieve the pain and photophobia. Darier has great faith in the subconjunctival injection of **Antiseptic Solutions** in traumatic or post-operative infections, if made as close to the focus of infection as possible. Lee,[28] of Liverpool, extols this treatment except where contraindicated by considerable vascular injection or chemosis.

It is in affections of the *choroid* and *retina* of a recent inflammatory character, including the choroiditis of myopia, that **Cyanide of Mercury**

injections, 1–5000, promise a real addition to our armamentarium for, unlike the anterior affections of the eye, they lie beyond the reach of other local treatment. The writer has in some cases obtained a remarkable effect on the choroid, though it must be confessed that in many others no good at all has been done. De Schweinitz[29] reports one case, however, of a man, aged 29, with a marked uveitis, in whom the subconjunctival injection of 10 min. of a 1–5000 solution of cyanide of mercury induced an attack of acute glaucoma with T + 2 lasting for five hours. Ten injections of normal saline had been made previously, and a number were made afterwards with none but beneficial effects.

Iodate of Soda injections, 1–1000, are stated by Darier to produce reduction of tension in the symptomatic *glaucoma* of iridocyclitis, of exclusion of the pupil, of glaucoma from rapid swelling of a discissed lens, and in some cases of absolute glaucoma iridectomized without result. Three injections on successive days are stated by Darier to reduce the tension from T + 3 to T + 1 or 0. Another experimenter with this reagent is Schiele,[30] of Kursk, who uses solutions of from 1–5000 to 1–1000, adding a drop of 1 per cent solution of acoin to each injection to render it painless. He finds the injections to have an analgesic effect on *uritis*, *cyclitis*, etc., within a few hours, also reporting good results in glaucoma. He supposes their action to be that of a lymphagogue, by causing a vascular dilatation, and also antiseptic by virtue of iodine set free.

Pflugk has taken up Badal's treatment of cataract by eye-baths and drops of **Iodide of Potassium,** with the modification of injecting a 1 per cent solution subconjunctivally. He advocates this treatment twice weekly for every case of *incipient subcapsular cataract* for which eye-drops and baths prove unavailing. For capsular and nuclear cataracts he finds it useless. Unfortunately, the good results claimed by Badal for the local KI treatment of cataract have not been confirmed by the majority of observers, but there are cases in which subconjunctival injections certainly deserve a trial.

Treatment by Local Heat.—The value of both **Moist and Dry Heat** as therapeutic agents in diseases of the eye has long been recognized. Though there are, it is true, forms of hyperæmia of the conjunctiva which are greatly benefited by very hot sponging, yet as a rule it is the deeper structures in the eye, especially the iris and ciliary bodies, which respond to the influence of local heat. The use of poultices has long been abandoned by the profession on bacteriological grounds, though the out-patient departments of hospitals are continually visited by victims of this malpractice among the poor. It is true that a poultice will sometimes afford great relief, but it favours the growth of micro-organisms too much to permit its recommendation.

Moist heat in the form of **Hot Fomentations** can be applied in many ways. Poppyhead or chamomile, and other medicinal additions to the water, frequently obtain credit for the good which is due to the heat alone. It is well, however, to soften the asperity of hot water either

by such means, or by the addition of a little milk or thin starch. A jug is a far better receptacle than a basin, since the heat is retained longer. The usual plan of bending the head forward in order to bathe the eye with hot water has the disadvantage of increasing the hyperæmia of the eyeball just at the time when the coats of the blood-vessels are relaxed by the heat. For this reason alone hot fomentings sometimes fail to do the good expected of them. A far better method in which to instruct the patient is to place a small sponge or a piece of bread about the size of a hen's egg in a clean pocket-handkerchief. If the bread be chosen, a spoon may be left in the jug, and after dipping the bread, in the handkerchief, into the water, the back of the hot spoon may be pressed against it so as to impress a hollow upon it adaptable to the shape of the eye. The patient should sit with head erect and hold the heated sponge or bread, still in the handkerchief, against the eye, until the heat begins to wane, when it is redipped and the process repeated. It is indeed well to have two fomenting pads, one of which is being heated while the other is applied. A towel across the chest protects from drippings. After beginning the use of this plan many years ago, I obtained much better results than previously.

Ingenious appliances have been invented to propel **Hot Steam** against the eyes, but these are not to be regarded with much favour, for it is impossible to keep the heat steady enough, owing to currents of air in the room. **Moist Pads** on the eye maintained at a steady heat by artificial means, as by electric warmth, are not so detrimental as poultices, if the temperature is kept rather higher than microbes relish, and I have sometimes found them of value, especially in certain conditions of the eyelids. I once constructed an apparatus which allowed a **Stream of Hot Water**, maintained at a uniform temperature, to flow past the bulb of a thermometer, over the eye, being caught by a special receptacle and then carried away. It promised excellent results, but has given place in my hands to electric heat, as described further on.

We may now consider the forms of **Dry Heat** available for the eye. Little bags containing bran, chamomile flowers, sand, etc., placed in the oven or laid before a fire, and then transferred to the eye, form an ancient method of treatment, which is still not without its merits, though perhaps a little troublesome. When the eyeball is very tender, a plan may be adopted which came into use many years ago, of pressing cotton wool or lambs' wool against the outside of a hot-water jug, from whence it is transferred to the eye. The specific heat of such materials, however, is so small that the amount which they convey to the eye is inconsiderable unless a highly gymnastic rapidity of transference can be attained.

Many attempts have been made to secure a continuous form of heat to take the place of intermittent varieties, **Leiter's Coils** for example, the best modification of which is represented by an ingenious appliance called the "Perfecta," for automatically regulating the temperature of the hot water circulating in the indiarubber coils. I used this

instrument for some time, until electricity became available, and found it effective, though requiring considerable attention and possessing the disadvantage of the weight on the eye of the rather hard rubber tubes filled with water. An inflamed eye naturally dislikes pressure. **Japanese Muff-warmers** were a distinct gain to ophthalmology, when introduced a few years ago. Their portability renders the user independent of hot water or electrical supplies, and the smaller ones can even be fastened on to the eye by a bandage. They are of course a little hard and heavy, but plenty of cotton-wool or lambs'-wool beneath them mitigates this disadvantage. A greater defect lies in the uncertain and changeable amount of the heat, which may at one time be fierce, and a little later die out.

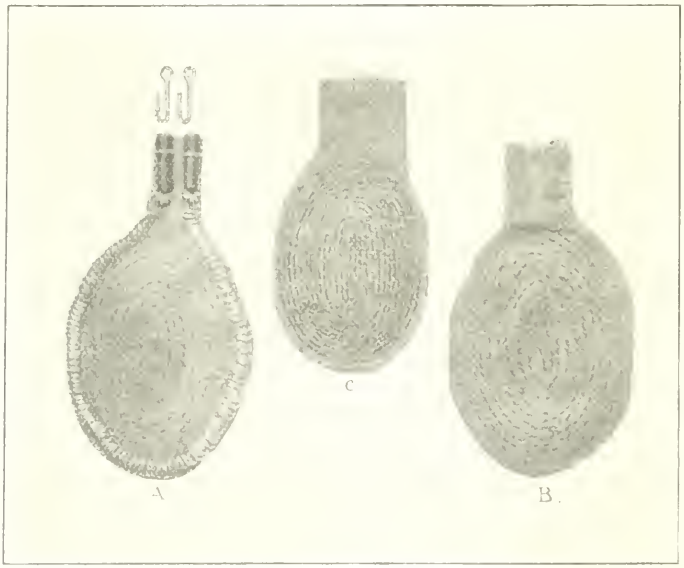


Fig. 35.—Eye warmers of Flannel flower [illegible] wire, and provided as shown at *A* with necklace attachments.

Undoubtedly **Electricity** affords the most perfect means of administering dry heat. About fifteen years ago an asbestos pad, with electric wires circulating through it, was recommended in America, but did not appear to gain general favour. Incandescent electric lamps, preferably blackened outside, have been employed by many ophthalmic surgeons, though I have no experience of their use. They must of necessity be hard, and do not adapt themselves to the shape of the eye, one part of their convexity heating one spot of the eye more than the rest. The only way to lessen this disadvantage is to apply an abundance of soft material between.

I was much interested a few years ago (when a desperate case of iridocyclitis compelled me to make experiments for the best mode of applying dry heat) to find that nothing less homely than our old friend **Flannel** would lend itself to the purpose, if **Fine Insulated Wires** were either stitched to it, or worked through its substance by a sewing machine to carry currents of electricity sufficient for the therapeutic warming of an eye. Some of these pads I have had home-made so light and soft that it would be almost impossible to distinguish them from unwired flannel by uneducated fingers. They adapt themselves to the shape of the eye, their weight is practically nil, and the temperature can be maintained for hours or days together at any required degree. Unfortunately their very delicacy makes their renewal not infrequently necessary, since wires so thin are apt to break. For eyes not acutely sensitive, this disadvantage can be overcome by sewing stronger wires on the flannel, but they are of course not so pleasant. Even after cataract extraction, the fine heaters can, in the event of neuralgia, be incorporated in the dressing.

Fig. 36.—Section of the Transformer.

The source of electricity can be an accumulator, provided with a rheostat, but it is very convenient to possess perfectly safe means of drawing the current from the mains. To permit of this, I constructed a transformer capable of very delicate graduations of current by the device of a long screw, working within the core, which gradually moves the secondary coil over the primary (*Fig.* 36). This transformer can be attached to any lamp socket, as

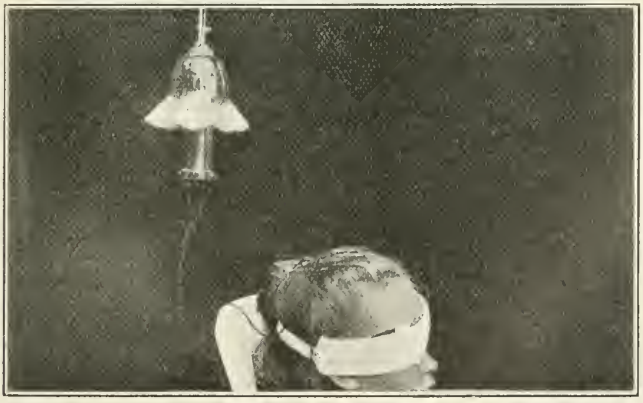


Fig. 37.—To show the Screw Transformer in use.

shown in *Fig. 37*, and by turning the handle of the crank at its dependent end, the heat can be regulated to a great nicety and without any fear of a sudden jerk, as when a rheostat works stiffly or irregularly. Nothing is more steady than screw motion.

There is of course in the use of such a transformer no direct connection with the mains, and only low voltage electricity travels through the flannel pads. Transformers, unfortunately, are only suitable for

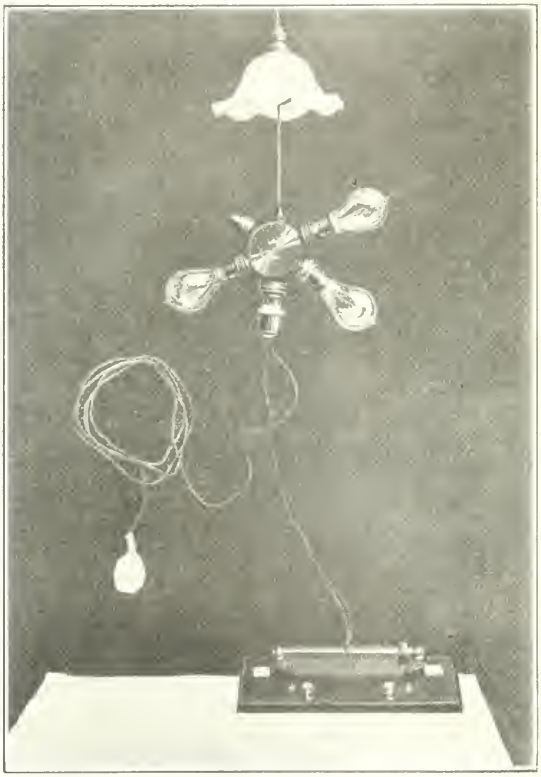


Fig. 36. The Stellar device feeding a rheostat and an eye-warmer in parallel.

alternating currents. For continuous current installations many resistances and series lamps are obtainable, and the apparatus which I devised, and which is shown in *Fig. 38* is perhaps not more advantageous than others. It enables, however, a variety of lamps of different candle-power to be used, and divides the current which has passed through them into two streams, one of which goes to the eye-heater and the other to a rheostat. The greater the resistance interpolated in the rheostat, the greater the current that flows to the

eye-pad, and *vice versa*. In practice a very delicate graduation is obtainable, though not quite so fine as with the transformer.

These appliances are not very suitable for use in patients' own houses. A certain amount of electrical training is desirable, and it is found better to restrict their use almost entirely to hospitals and eye homes, where they can be regulated by those who understand them. They have proved of the greatest service in the recovery of many cases which appeared hopeless, especially in that difficult combination of *gouty iridocyclitis with glaucoma ;* also in *tuberculous affections* of the anterior segment of the eyeball, combined in the latter case with open-air treatment. There is just one temperature for every eye which suits it best, and which is found by experiment for each case. In *rheumatic iritis*, steady, gentle, continuous warmth is most grateful, and a certain number of subacute glaucomata are subdued by it. These are generally of gouty origin. Not all forms of ocular neuralgia, however, are relievable by heat. Those which are most helped are of rheumatic origin. Some kinds of neuralgia are aggravated by it.

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EYE, TUBERCULOSIS OF. (*See also* Tuberculosis, Ophthalmo-Reaction.) *Ernest E. Maddox, M.D., F.R.C.S.*

W. Stock[1] finds the injection of tubercle bacilli into the blood results in a more attenuated form of the virus in the eye than is obtained by implantation into the anterior chamber, and points out that the flaring up of a more or less quiet iritis after surgical interference may be due to disturbance of the bacilli in such a way as to exchange the attenuated form of *Endogenous Tuberculosis* for the more virulent *Implantation Tuberculosis*. He finds the variety of clinical manifestations of endogenous experimental tuberculosis to be remarkable. The commonest is nodular iritis, rarely appearing before the eleventh day, and sometimes combined with interstitial keratitis. Choroiditis also results, generally equatorial, sometimes followed by softening and bulging of the sclera. Deep marginal keratitis sometimes occurs, and more rarely nodular affections of the conjunctiva. The above results led Stock to examine eyes affected with chronic iridocyclitis, both histologically and by implanting bits of iris from them with a view to the discovery of tubercle, but the former led rarely, and the latter never, to positive results.

He therefore came to attach more importance to the results of injection of alt tuberculin for diagnostic purposes, insisting on being completely guided by Koch's original directions,[2] which are: "The temperature of the patient must be watched for one day—better for two—and if over 100° F. no tuberculin test is admissible. If the case proves suitable, the patient gets an injection of from 0·1 to 1·0 mgram of tuberculin under the skin of his back in the morning. Should reaction not ensue, we give the double dose, not the next day, but the day after. But should there be any rise of temperature, even the slightest, we do not increase the dose, but repeat it after the temperature has become normal again; the reaction will now be stronger than the first time, which is one of the surest signs of the presence of tuberculosis. In case the first small doses do not give a positive result, we increase the dose to 5 mgrams and, finally, to 10 mgrams. The latter dose is repeated twice, and only if there is no reaction after that do we feel justified in excluding any recent or progressive tuberculous affection." Of seventy-six patients with chronic uveitis thus investigated, a positive result was reached in forty-five cases, with local reaction (ciliary injection, photophobia, etc.), in seven.

Stedman Bull[3] found enlarged glands present in about 85 per cent of cases of anterior tuberculosis of the eye.

Sydney Stephenson[1] maintains that posterior tuberculosis of the eye is due to an infection of the blood-stream, and secondary to a focus of tuberculosis in some other part of the body. He points out that the coincidence of enlarged glands does not necessarily stamp an obscure eye disease as being tuberculous, neither does a positive reaction from the tuberculin test, since that reaction may be due to a tuberculous focus elsewhere in the body than in the eye under examination; we only learn from the result of the test the probability of the eye being affected with tubercle. Should, however, a focal reaction occur in the actual disease of the eye, such as would be shown by the exacerbation of inflammatory phenomena, it would be proof positive that the disease of the eye is tuberculous. Such focal reactions, however, are comparatively uncommon. He reminds us that physical signs are present in only a minority of cases of tuberculosis of the bronchial glands, and if the condition be dormant, the familiar symptoms are absent, such as anæmia, pyrexia, tachycardia, intractable dyspepsia, dyspnœa, spasmodic cough, and loss of flesh. In their absence, latent tuberculosis may be quite undiscoverable by any mere physical examination, though the estimation of the tuberculo-opsonic index would have its value, and the tuberculin test, as described later, a greater one still.

Brückner,[5] in thirty-five cases of iritis, obtained a general or local reaction in thirteen cases after Koch's injections; and Sydney Stephenson records three cases in which the results were positive, also four cases of choroiditis, simulating the specific form, in which the Calmette reaction was positive.

Rohmer,[6] of Nancy, divides tuberculous affections of the eye into three groups: (1) Those of the posterior segment, comparatively rare, usually indicative of grave general disease and not very amenable to treatment; (2) Of the iris, ciliary body, and cornea, mostly due to endogenous infection; (3) Of conjunctiva and sclera, which are frequently subject to direct inoculation. The last group only can be effectively dealt with by excision or cautery. The second class appears to divide itself into two pathological varieties, most easily distinguished in the cornea. The first resembles interstitial keratitis of syphilitic origin, in which gradual invasion of one or both corneæ occurs, and this variety is said by Rohmer to respond very favourably to injections of tuberculin. The corresponding variety of iritis presents no visible nodules, is slow and persistent, liable to frequent recurrences, and is also readily amenable to treatment by tuberculin. In this variety, tuberculous nodules are said by Vennemann to be found on the posterior surface of the iris. The other variety of keratitis is apt to be associated with a similar kind of iritis, tuberculous nodules being visible either in the substantia propria of the cornea, or more frequently on its posterior surface, close to the iris angle, which is indeed well known to be the situation of election for tuberculous deposit in the eye. The corresponding iritis presents grey or yellowish nodules on the front of the iris.

TREATMENT.—The ordinary systemic treatment for tubercle in the eye differs but little from that of general tuberculosis, and consists in improving the general health, an outdoor life, with the eye itself kept warm, and the usual internal remedies. I have noted excellent results from the combination of **Dark Electric Warmth** to the eye with high feeding and open-air life, avoiding excessive fatigue. The open-air shelters provided in some health resorts are helpful to those who cannot walk much, and few cases do not yield to measures of this kind, though several months of it are often necessary. Locally, eye-drops containing **Aristol** are of service, in addition to **Dionine** and **Atropine,** if required. A description of treatment by **Tuberculin** will be found on its appropriate page. (*See* TUBERCULIN and TUBERCULOSIS; also Prof. Béraneck's article, p. 61.)

Derby[7] describes the advantages obtained by patients of the Massachusetts General Hospital, where a special department is run for the tuberculosis class. "There the patient is carefully examined, weighed, and the temperature taken. He is given explicit directions as to general living, fresh air, amount of food, exercise, and the like. He is given a book in which to make a careful record of his daily life. He is visited in his home by one of the class workers, and is shown how to live in the fresh air, and occasionally he is helped financially when that is necessary."

REFERENCES.—[1]*Graefe's Archives*, June, 1907; [2]*Ophthalmoscope*, 1907, p. 733; [3]*Ibid.* p. 735; [4]*Ibid.* 1907, p. 686; [5]*Arch. f. Augenheilkh.* T. lvi. p. 352; [6]*Arch. d'Ophthalmologie*, July, 1908; [7]*Arch. of Ophthalmology*, 1908, p. 527.

EYELIDS, DISEASES OF. *Ernest E. Maddox, M.D., F.R.C.S.*

Paralysis of Eyelids.—The photographs on *Plate XVIII* illustrate important points in the symptoms of paralysis of the cervical sympathetic. The patient, aged 36, had suffered from this affection for a year, and it was coincident with, and probably caused by, moderate enlargement of the right lobe of the thyroid. *Fig. A* shows moderate ptosis of the right eye, due, not to weakness of the levator but to elongation of the eyelid, from paralysis of the smooth muscular fibres which connect the levator tendon with the upper margin of the tarsal cartilage. In *Fig. B* the nature of this paralysis is beautifully shown. The fold of skin which stands out above the tarsus in the left eyelid, and which represents the normal condition, is due to the physiological tone of the smooth muscular fibres spoken of. Their paralysis results in the appearance seen in the right eyelid. The fold has practically disappeared, and the breadth between its remains and the ciliary margin of the eyelid is seen to be considerably increased. It will be noticed in consequence that the whole eyelid is elongated by that amount. *Fig. C* illustrates the fact that the levator palpebræ has lost none of its power, for on looking up, very little difference indeed is perceptible between the elevations of the two upper eyelids.

It will also be seen, on careful examination of this photograph, that the interval between the right eyebrow and the sulcus of the right eyelid is greater than on the left side. This is due to the vicarious elevation of the right eyebrow by the occipito frontalis to allow for the raising of a lengthened eyelid.

At the onset of the affection in this case, it was only in the evening that the drooping of the right upper lid was noticed. Gradually it began to droop earlier in the day, and even now it scarcely droops at all in the morning, though the eye feels swollen and stiff.

As regards the pupils, though the right is seen in *Fig. A* to be slightly smaller than the left, the difference is not great because of the strong light in which the picture was taken; were the light subdued, the difference would be far greater, the left pupil dilating far more than the right, owing to activity of the dilator pupillæ muscle, the existence of which is now pretty clearly established. Facing a window, the right and left pupils are 2 mm. and 3 mm. diameter respectively: in the shade they are 3 mm. and 5 mm.

In some cases, though not visible in this one, the eyeball appears to sink slightly back into the orbit and to exhibit a trifling hypotonus.

Dilatation of the pupil owing to the stimulus of the skin reflex is of course absent on the affected side, which moreover, is sometimes redder and warmer than the other in such cases, though after a time it becomes paler and cooler. When the latter condition is established, perspiration ceases on the affected side, a phenomenon which, as Fuchs has well pointed out, is easily discerned in men by the hat lining, which is stained with sweat on one side and not on the other.

Ptosis.—Charles Wray[1] operates on slight ptosis by making a series of punctures with a cautery just above the upper border of the everted

PLATE XVIII.

PTOSIS FROM PARALYSIS OF THE CERVICAL SYMPATHETIC.

(From photographs lent by Dr. Maddox.)

Fig. A.

Fig B.

Fig. C.

tarsus. A series of apertures are thus burnt in the peripheral part of the tendon. In very slight cases a single row of punctures is sufficient, but when required, another row, or indeed several rows, may be made (*Fig.* 39). As a rule it is necessary to push the cautery upward towards the orbital margin in the neighbourhood of the fronto-palpebral fold. The procedure may be varied by admitting the cautery through a small aperture in the skin, which aperture, being movable, permits the cautery to be applied where needed. A broad spatula is passed between the lid and the globe in the latter case, and the lid is lifted away from the eyeball. Snell's cautery is preferred for the purpose.

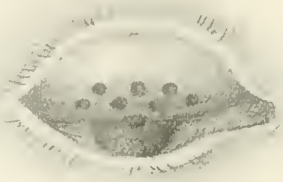

Fig. 39.—To illustrate Mr. Wray's operation for Ptosis.

REFERENCE.—[1]*Ophthalmoscope*, 1908, p. 767.

FACIAL HEMISPASM. *Purves Stewart, M.D.*

This affection is a chronic and often a most intractable one. It must be clearly distinguished from facial tic or habit-spasm. A tic is essentially a psychomotor act; a reflex spasm, on the other hand, begins locally, perhaps in a single muscle, say the orbicularis oculi, and spreads to adjacent muscles. Many cases of facial hemispasm are due to local irritants in the region of the face. The best known reflex spasm is tic douloureux (which is not a true tic), where the face is thrown into strong spasm during a paroxysm of pain. Apart from trigeminal neuralgia, however, we should look for other reflex causes, generally in the territory of the fifth nerve, such as a decayed or non-erupted tooth, a nasal polypus, etc. Such local causes should be removed. But sometimes no exciting cause can be found, for the spasm may continue to recur after the original exciting cause has passed away. In such cases **Bromides** and **Valerian** internally, with **Galvanism** to the affected muscles, should first be tried. If these fail, we have to consider stronger measures. Some cases can be cured by producing temporary paralysis of the facial nerve. For example, Noceti[1] records three such cases where he injected 1 cc. of an 80 per cent solution of **Alcohol** with 1 per cent of **Cocaine** into the nerve-trunk at the stylomastoid foramen. Temporary complete facial palsy occurred, lasting several hours. It may be necessary to repeat the injection twice or even thrice within a few days. In one of Noceti's cases the spasm was permanently cured by two injections at intervals of three days; in another, three injections were required at intervals of a week. Patrick[2] also reports three cases, in two of which good results were obtained by this method; in the third case the attempt to reach the nerve failed.

REFERENCES.—[1]*Arch. d'Ophthalm.* Nov. 1907; [2]*Jour. of Nerv. and Ment. Dis.* Aug. 1908.

FAVUS. (*See also* RINGWORM.)

(*Vol.* 1896, p. 317)—Cut the hair short, and epilate the areas affected. Rub in an ointment containing **Resorcin, Sulphur,** and **Salicylic Acid** every night; paint with **Iodine** every two or three days; wash the head daily with soap and water. Or a liniment of **Thymol, Chloroform,** and **Olive Oil** may be used instead of the ointment. Cure will take months to accomplish.

FOREARM. (*See* SLING FOR FOREARM.)

FOREIGN BODIES IN THE TISSUES. *Priestley Leech, M.D., F.R.C.S.*

Chitty[1] describes a very good method of removing foreign bodies which are opaque to the X rays. The patient is taken into the X-ray room and the foreign body is roughly localized with the aid of a fluorescent screen. The area in which an incision will have to be made is then carefully cleansed, and is infiltrated with a 1 per cent solution of eucaine. A further examination of the part is now made with the X rays. Guided by the shadow the surgeon plunges the needle of the infiltrating syringe into the tissues till it touches and (in the case of a needle) lies as nearly as possible parallel to the foreign body. A few more drops of solution may now be injected, and the syringe is then detached from its needle, which is left sticking into the part. The needle is cut down upon, and the incision necessarily exposes the foreign body at the same time. Except where the foreign body lies deeply, it is often quicker to surround both it and the localizing needle by an elliptical incision, and to remove them both, together with a little skin and subjacent tissue, in one mass.

REFERENCE.—[1] *Lancet*, June 4, 1908.

FOUL BREATH. *Robt. Hutchison, M.D.*

In an important paper on this subject, Wylie[1] points out that fœtor of the breath may be either purely subjective or entirely objective, or it may be perceived both by the patient and by those with whom he comes in contact. When subjective it is experienced by the patient alone. Examples are met with in the peculiar sensations of smell experienced by patients suffering from perityphlitis, chronic constipation, obstruction of the bowels, liver abscess, malignant disease of the intestinal canal. Of the same order also is the "curious burning smell" noticed by patients suffering with disease of the brain and associated with abscess or tumour in the vicinity of the temporo-sphenoidal lobe. Objective fœtor is observed by persons associated with the patient. In most instances the patient is himself also conscious of the odour.

There are different *types of fœtor* :—

1. The putrefactive type is the commonest. Its odour is like decomposing cheese. It occurs in such diseases as that form of rhinitis in which the pus has become hard and cheesy, a condition associated usually with disease of the antrum, and called caseous rhinitis. A similar odour is found also when decomposing material collects in the nasopharynx, pyriform fossæ, and tonsil crypts, and in tertiary specific disease of the nose and pharynx.

2. The sulphuretted hydrogen type occurs in gangrene of the lung, in bronchiectasis, etc., and is often so pungent as to cause the friends and even the nurse to avoid the sufferer.

3. The garlic type is apparent in those who take such drugs as bismuth and arsenic regularly.

4. The sweetish type is one of the diagnostic signs of glycosuria, and is generally associated with the presence of yeasts, etc., in the throat and nose; also in beer drinkers.

5. The toxic or hepatic type is associated with various forms of bacteria, such as the *Bacillus butyricus*, which is found in the mouth, nose, and fauces of dyspeptic "bilious" people, and also in those who do not properly masticate, but "bolt" their food in an irrational manner, or in those who do not clean their teeth.

Fœtor of the breath may further be classified *according to the different regions which are responsible for its source.* These are the mouth, nose, nasopharynx, larynx, and lungs. Fœtor is also due to general constitutional disturbances.

The common causes of foul breath may thus be briefly summarized: (1) Diseases of the nose and its accessory cavities, causing nasal obstruction and mouth-breathing; (2) Imperfect deglutition; (3) Oral and lingual affections; (4) Diseases of the teeth and gums; (5) Diseases of the tonsils; (6) Chronic suppuration of the middle ear; (7) Affections of the nasopharynx; (8) Diseases of the lungs; (9) Foreign bodies in the mouth, nose, pharynx, or larynx; (10) Constitutional causes.

1. Nasal obstruction, or mouth-breathing, may be due to adenoid growths, enlargement of the turbinal bodies, deviations of the septum, and spurs or outgrowths on the septum. All these not only cause imperfect ventilation through the nose, and the collection of more or less putrid secretion, but give rise to mouth-breathing, perverted secretion, and dryness of that region.

Some diseases of the nose cause a specially pronounced odour—for example, rhinitis sicca, which arises when the secretion is impaired or diminished in quantity and quality. A similar condition is found in atrophic rhinitis, where actual structural degeneration of the mucous membrane has taken place: in caseous rhinitis, where the pus and débris are charged with various forms of moulds, yeasts, and putrefactive bacteria, such as *Aspergilli torulæ* and the *Bacillus butyricus*; in chronic diseases of the accessory cavities where pus is lodged in the maxillary antrum, or the ethmoidal, frontal, or sphenoidal sinuses; and in tertiary syphilis with necrosis of the ethmoid or vomer. In septal perforations, whether from operations, from tuberculosis, or from syphilis, there is also fœtor, and the same is found when polypi and sinusitis co-exist. Generally speaking, fœtor may be present in any malformation of the nose which interferes with free discharge and proper ventilation.

Another disease attended with fœtor is chronic epistaxis, especially the "leaky" form, which is occasionally found in plethoric individuals

and in those suffering from portal obstruction; also in dysmenorrhœa. This form of epistaxis also occurs when fibroma or sarcoma is present. The blood adheres to the mucous membranes, soon becomes septic, and so creates an unpleasant odour.

2. Imperfect deglutition causes accumulation of food in the mouth, round the teeth, in the buccal pouch, the tonsils, behind the soft palate, in the pyriform fossæ of the larynx, and in the glosso-epiglottic and hyo-epiglottic fossæ. Such conditions generally arise from paralysis of the muscles, especially that form which follows diphtheria or any of the fevers. It may also occur from habitual carelessness in swallowing.

3. Oral causes of fœtor should be divided into two great classes: those connected with the tongue and with the teeth.

A furred tongue may be merely a local manifestation of disturbed digestive functions, or it may be a local trouble by itself. There are several varieties of furred tongue:—

(*a*). The hypertrophied condition of the papillæ seen in "black tongue" is a pigmentary deposit in elongated papillæ which are undergoing keratinoid degeneration. The cause of this condition is not known.

(*b*). The conditions in which accumulations of bacteria, such as yeasts, *Proteus vulgaris*, *Leptothrix*, etc., congregate on the tongue.

(*c*). The state in which a superficial thickening of the epithelium has taken place, and which varies very much in character. When this condition is pronounced, we have what is called leukoplakia, recognized by Fournier, Butlin, and others as frequently pre-cancerous.

Ulceration of the tongue may simply be due to the irritation of a tooth or a symptom of digestive disturbance; when deep ulceration is present, it is most likely due to the breaking down of a malignant growth or to tubercle or syphilis. The diagnosis in some cases is difficult, but as a rule tuberculous ulceration of the tongue is shallow and not deeply excavated. It has well-defined edges and occurs without much pain, while specific and malignant ulcerations are generally painful. Histological examination of the scraping from these ulcerations will settle the diagnosis.

4. As regards the dental causes, we have:—

(*a*). Pyorrhœa alveolaris (Rigg's disease), which may be acute or chronic, and often exists without actual disease of the teeth, being generally referred to as "spongy gums." Tartar and, later on, pus are formed and collect between the gum and the tooth, and little pockets result which lead to recession of the gum. The roots of the tooth are exposed, and the affection may result in caries. Mercury often causes this condition. Pyorrhœa is associated with various bacteria, of which *Spirochæta refringens* and *B. fusiformis* are the most prominent.

(*b*). Decomposing food, tartar, or pus between the teeth and at the seat of caries.

(*c*). Caries of the teeth and retained stumps.

(*d*). Imperfect and cheap artificial dentures and neglected hygiene.

5. As regards the tonsils :—

(*a*). The most common cause for tonsillar fœtor is a change which takes place in the lacunæ or follicles. These become filled with pearly masses of dead epithelial débris, and loaded with bacteria or particles of decomposing foods. Such lacunar accumulations can be expelled by pressure, and are thus distinguished from a keratosis which is closely adherent ; in this latter also there is not necessarily any odour.

(*b*). Acute ulceration of the tonsils is not associated with any definite type of fœtor ; it is in the more chronic forms that the odour is so unpleasant.

(*c*). Malignant growths and tertiary syphilitic disease of the tonsil itself do not cause fœtor at first, but these diseases soon invade the surrounding structures, which interferes with deglutition and favours bacterial activity ; the fœtor then becomes pronounced.

6. As regards chronic suppuration of the middle ear, this often causes a fœtid breath by the stinking pus getting into the nasopharynx through the Eustachian tube, and keeping the nasopharynx (which in healthy states is sterile) in a septic condition.

7. Affections such as adenoid growths, and simple and malignant neoplasms in the nasopharynx, cause a fœtid breath by interfering with the proper movement of the parts, by accumulations of secretions, and by obstructing the natural ventilation and drainage.

8. In the lungs putrefactive changes take place in such diseases as bronchiectasis and pulmonary gangrene, causing a most pungent and offensive odour. The smell of bronchiectasis is a mixture of sweetness and stink.

9. Foreign bodies in the nose, pharynx, and larynx cause a most offensive odour, since they obstruct ventilation and drainage, and excite inflammatory processes and sepsis.

10. The constitutional causes are :—

(*a*). Gastro-intestinal derangements and dyspepsia, especially those which are associated with dilatation of the stomach. In patients troubled with severe chronic constipation there is a peculiar sickly, almost fæcal odour from the breath. Spirit drinkers have quite a different odour from beer drinkers ; the former is of a vinegar type, while the latter have the characteristic smell of stale malt liquor. The breath of cigar and pipe smokers has a different smell according to the favourite form of using tobacco.

(*b*). Different varieties of glycosuria cause a sweetish odour to the breath.

(*c*). Menstruation always causes some change in the breath ; in some individuals it is so pronounced that they can hardly mix with society during that period.

(*d*). During lactation also in some patients there is a marked odour from the breath.

(*e*). Drugs have a great influence on the breath, and it is one of the signs to watch for in their administration. Bismuth and arsenic have been already referred to. Lead and mercury produce a well-known

effect on the gums, and in extreme cases much fœtor. All preparations of sulphur cause a characteristic sulphuretted hydrogen smell of the breath. Copaiba and valerian have a cats'-meat smell; iodoform a rancid smell; and belladonna and opium diminish secretion and cause a dryness of the mucous membrane, to which bacterial activity may be superadded.

(*f*). Occupation has also a great deal to answer for as regards foul breath. Milkmen, or those continually working in milk, have a peculiar odour owing to constant contact with the *B. butyricus*. The reason of this is probably the direct transference of the bacillus by the fingers to the nose, with consequent rhinitis. The same theory applies to workers among skins and furs, who have a peculiar animal odour. Those who work with phosphorus, lead, or brass, have a peculiar metallic odour from their breath, which is associated with rhinitis and "spongy" gums.

(*g*). Many nervous diseases cause an odour from the breath, such as is found in paralysis and apoplexy. Mental dullness and physical disability prevents proper cleansing of the lips, teeth, and tongue; thus sordes accumulate and fœtor is produced.

The pathology of foul breath caused by conditions other than organic disease and foreign bodies is somewhat complicated. It can be considered under three heads:

1. Imperfect secretion of the glands, both mucous and albuminous. This occurs in atrophic rhinitis, rhinitis and pharyngitis sicca, in glycosuria, and under the influence of drugs such as belladonna, opium, etc.

2. Deficient leucocytosis and absence of lymphoid elements such as occurs in atrophic rhinitis, a disease characterized by complete disappearance of all the normal lymphoid structures and loss of the phagocytic action of the leucocytes. Under such conditions bacteria grow rapidly, and fœtor results.

3. Action of bacteria. Some are present in every variety of fœtor. The *B. proteus vulgaris* is of frequent occurrence whenever decomposition is taking place, as in caseous rhinitis, lacunar accumulations in the tonsils, pyorrhœa alveolaris, and in all dental troubles, together with ulcerations of the mouth, and in chronic suppuration of the ear. The *S. refringens* (*S. fœtida*), accompanied by fusiform bodies (Vincent's bacilli), are associated with all fœtid accumulations in the throat, nose, and ear. The *B. butyricus* is very common in milk-fed patients and in those engaged in dairy work, also in infants fed from the breast. The *B. coli communis* and the *B. subtilis* are very rarely absent from oral and pharyngeal infections, while yeasts and toruke give the peculiar odour to beer drinkers and those subject to glycosuria. Other fœtor-producing organisms are: *B. fœtidus ozæna*, *B. pyocyaneus*, *B. lactis erythrogenus*.

Since most of these bacilli flourish best without oxygen, it is essential to curtail their activity by a free ventilation of the parts. The *B. proteus vulgaris* is a most active cause of fœtor and of ptomaines. Many of these bacilli are associated with different odours or fœtors,

This fact depends to a great extent upon the material or nutrient on which they grow, also upon the conditions of heat, light, and air.

Most ulcerated surfaces give rise to fœtor, and it depends on the nature of the bacteria, the scavenging power of the leucocytes, and the implication of bone or cartilage, whether the fœtor is pronounced or not.

Malignant disease may be present in the nose, pharynx, or larynx, without much, if any, fœtor, but as soon as ulceration occurs, or the bone or cartilage is attacked, then the fœtor becomes very offensive.

Lederer[2] suggests the term "bromopnea" to designate fœtid breath. He adopts a different mode of classification from Wylie, and divides cases into two classes: (1) one in which the contamination of the breath takes place after the gases enter the lungs, and (2) one in which the contamination of the gases takes place in the system before they enter the lungs. Those in the second class might be designated as suffering from true bromopnea (*Bromopnœa vera*), while the first type of fœtid breath might be termed pseudo or false bromopnea (*Bromopnœa nota*). An example of true bromopnea would be the sour-apple odour in the breath of diabetics, while the stench accompanying angina tonsillaris would be an example of pseudo or false bromopnea.

Treatment.—Successful treatment depends, says Wylie, upon a clear recognition of the particular cause at work. Any nasal obstruction, whether due to hypertrophy or to new growth, should be removed, so that free drainage and ventilation are established. Any abnormality in deglution should be corrected. Hasty mastication should be forbidden. When the trouble is of dental origin the aid of the dentist is indispensable, and must not be postponed. Hygienic measures should be enforced before and after each meal; the tooth-brush should be thoroughly employed at least twice a day, but especially after the last meal, in order to remove the accumulations which, if left *in situ*, naturally tend to ferment during the night. The brush should be used with a vertical rotatory movement to sweep the interstices between the teeth. Lacunar accumulations in the lingual or faucial tonsils should be evacuated, any ulcers should be touched with pure "phenol," and, if extensive keratosis be present, the tonsil should be removed, either *en masse* or by *morcellement*.

Suppurations of the middle ear must be treated by antiseptic drops; rhinoliths, foreign bodies in the nose, pharynx, or larynx must be removed. Causes, whether following the use of drugs, or those which are dependent upon occupations, or upon diet, must be attended to, and constitutional and gastro-intestinal diseases must be thoroughly treated.

With the object of clearing away fœtid accumulations in the nose and nasopharynx, "solvent" douches must be employed. It is useless merely to employ antiseptics which do not possess the power of dissolving mucin, albumin, and the constituents of crusts. The

best ordinary solvent is sodium sulphate (1 per cent solution), or sodium biborate or carbonate (in 0·5 per cent solution). The nose should be thoroughly douched with this until the breath-way is free from crusts and caseous matter. Antiseptics can be employed afterwards direct to the membrane by means of sprays. In mild cases, when the fœtor is not severe, and when the mucous membrane is still sensitive, the olfactory function not being destroyed, an atomizer of liquid paraffin containing menthol, oil of cinnamon, or eucalyptus, is preferable, but if the fœtor be very intense, Dobell's alkaline solution of phenol may be sparingly used.

We must next restore a healthy secretion by gentle stimulation. This can be done in mild cases by using a snuff composed of boracic acid with otto of roses; but when the disease is very atrophic and secretion scanty, 5 per cent of lysoform should be added as a powerful stimulant and antiseptic. It need scarcely be added that intranasal douching should be employed with the greatest care, and not persisted in for too long a period, owing to the danger of infecting the middle ear through the Eustachian tube. Severe cases of atrophic rhinitis are very tolerant of douches, and require such treatment at frequent intervals. Sea water, boiled and decanted, forms an excellent douche, especially when combined with a visit to the sea air. The nasal and pharyngeal mucous membranes, except in cases of atrophic rhinitis, are very sensitive, and will not tolerate antiseptic solutions of anything like the strength and intensity which the mouth does. Densely hard crusts are painlessly removed by inhalation of steam, camphor being added to the hot water as a stimulant. To facilitate oral hygiene, solutions of lysoform (1 per cent), sanitas, peroxide of hydrogen, etc., are most beneficial; permanganate of zinc (1 500), or zinc chloride (½ per cent), is recommended in cases of "spongy gums."

Lozenges containing formic aldehyde should be used frequently: they are non-poisonous, and act as powerful deodorants and antiseptics.

It is important in many cases of objective foul breath, such as ozæna, etc., to get the patient's confidence by reducing at least, if not overcoming, the fœtor. With the help of a snuff composed of lysoform, boracic acid, and otto of roses, the unhappy sufferer from ozæna may often be rendered fit for the society of his fellow-men and enjoy life.

In cases due to gingivitis, Lederer recommends the following lotion:—

R	Thymol	gr. 25	Alcoholis	1 oz.
	Acidi Benzoici	3ss	Ol. Menth. Pip.	1 m
	Tinct. Eucalypti	1 oz.		

A teaspoonful in a glass of water four times a day as a mouth-wash (*Müller*).

If the gums are spongy and there is suppuration he has had very gratifying results with liq. aluminæ acet., well diluted, as a mouth-wash. Permanganate of potassium is useful as a deodorizer, but this gives, of course, only temporary relief. Some recommend chlorine

compounds, such as :—R Liq. Chlori and Mellis āā 15·0; Aq. Dest 300·0 Use as gargle.

The gingivitis present, however, must be treated, and a strict regimen of oral hygiene observed, also the teeth cleansed, and every trace of salivary calculus carefully removed and the oral cavity kept alkaline by the use of bicarbonate of sodium or hydrated magnesia locally. An alkaline saponaceous tooth powder should be employed, one which contains no gritty substances like pumice, or acid materials like salicylic acid. It is difficult to recommend any of the preparations on the market, as no one but the manufacturer knows what they really contain. He finds the following very useful :—

R	Saccharini	0·12	Sodii Bicarb.	āā 8·0
	Cretæ Præcip. Pulv.	30·0	Acidi Borici	4·0
	Rad. Irid. Flor. Pulv.		Ol. Gaultheriæ	
	Saponis Pulv.		Ol. Menth. Pip.	āā gtt x

In diseases of the respiratory tract, besides the routine medical treatment, the use of a deodorant is useful to mask the fœtor. Permanganate of potassium is very useful in these conditions. A pleasant deodorizing pellet which, if slowly dissolved in the mouth, will mask bromopnea, is composed of thymol, menthol, eucalyptol, vanillin, and saccharin, of each 0·001.

In fœtor associated with constipation and gastric disorder, the use of laxatives and mild mercurials along with an acid mixture after meals is often helpful. Milk should be excluded from the diet and green vegetables and fruits taken freely.

References.—[1]*Med. Press*, May 13, 1908 ; [2]*Med. Rec.* Jan. 11, 1908.

FRACTURES. *Priestley Leech, M.D., F.R.C.S.*

R. Jones[1] writes a very timely and sensible letter about the public attitude in regard to fractures. He suggests that as a profession it behoves us to be wary, as opinion in the profession itself is so divided with regard to treatment. While Röntgen's discovery has been of immense value, chiefly in the classification of our injuries, it has done little to perfect or even alter our treatment of fractures. A long and careful training is necessary for the interpretation of radiograms, and the public should be made to understand this, and also to understand that end-to-end apposition of fractures is most rarely secured even by the most experienced surgeons. Correct alignment is much more important than an end-to-end apposition. In fractures of the shoulder- and elbow-joint he has discarded splints, and his results have been infinitely better than in former days.

Prof. Lucas-Championnière[2]* expresses some very commonsense views of this subject, views which are well worthy the study of surgeons in relation to a well-known recent action at law against an English

* We are glad to be able to give this distinguished surgeon's own views on the treatment of fractures in a special article which he contributes on page 292.—[Ed.]

surgeon. The following precepts have been incessantly repeated to his pupils for more than thirty years. "The accurate juxtaposition of the fractured extremities of bones in order to reproduce the normal arrangement is a laudable object: it is only achieved in a minimal number of cases. Never tell a patient that you are going to obtain and that you have obtained this exact result. The books teach you that this is the case, but clinically the statement is false, and it will turn against you in several ways. The conditions that are necessary in order that a limb should again become functionally perfect are far from demanding this exact juxtaposition. There are a large number of conditions which are more essential and which you should be sure of satisfying. Do not insist upon this claim."

Since the invention of radiography he has continually repeated to doctors: "Don't go and proclaim from the housetops that henceforth radiography has afforded you an exact picture of the fragments." That it has done so is untrue. He also lays stress on the difficulty of interpreting skiagrams.

Another pitfall is secondary softening of the callus; this phenomenon has been observed by Lucas-Championnière in fractures of both the upper and lower extremities. Do not tell a patient this is impossible, and that *secondary* deviation is a myth, and that if once he is fully cured he is safe against all secondary deviation. If you do he may bring an action against you, and if such an action were tried in France, although softening of the callus is a known fact, there would be plenty of witnesses to say that a fracture when once it is consolidated is not liable to fresh deformation, and that if deformation does exist it is due to a defect in the earlier steps of treatment. It is difficult to make the public believe that it does not know and understand everything relating to medicine. In the course of many lectures on medicine that it is now fashionable to deliver to the public, it would be better to enforce these ideas than to persuade one's audience that they can be of use in rendering first aid to the injured.

He also calls attention to the damage that may be done to a fracture by mechanotherapy or other forms of subsequent treatment. Even treatment by another surgeon may vitiate the result, e.g., a fractured patella treated by suture, and the patient, walking about excellently at the end of a month, has come back in three months with a stiff leg because all movement had been prevented by doctors who had said that absence of movement was essential for the safety and final repair of the limb. [The reviewer has seen exactly the same sequence of events in fractures about the elbow joint.—P. L.]. Doctors have forcibly bent joints which were a little stiff, when with a little patience the stiffness would have completely disappeared. The treatment caused considerable pain, and was followed by serious ankylosis of the joint near the fracture.

Both these articles should be pondered by surgeons and general practitioners, old and young.

Fracture of the Femur in the Newly Born.—Jones,[3] of Liverpool,

describes a simple method of treating fractured femur in the newly born and in small babies: it completely governs the fractured ends of the femur and allows of free movement of the hip. Of twenty-six cases of delivery fracture, eighteen occurred in the upper third of the femur, sixteen of them being at the junction with the middle third; seven occurred in the middle third, and three in the lower third. Six cases being some weeks old, the deformity was rectified by manual osteoclasis. The treatment consists in applying a Thomas's knee splint with extension as shown in the diagrams. Extension plasters are applied to the leg below the fracture, and the limb is passed through the ring which encircles the thigh at the groin and is padded over with felt, leather, and impervious oilskin. The thigh is pulled and the extension is maintained by the plasters, which are affixed to the lower end of the splint. A bandage is placed round the limb, and no further treatment is needed than now and again to extend the limb by pulling at the plasters. (See *Figs.* 40–43).

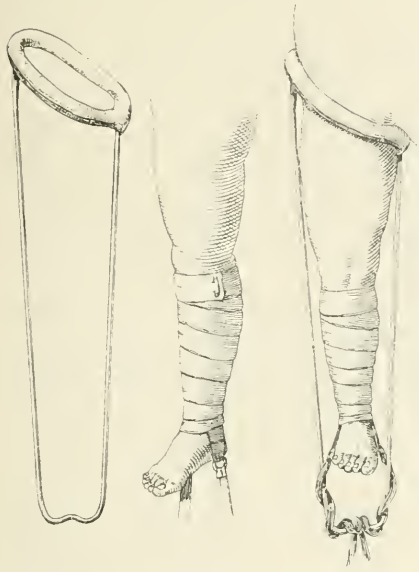

Fig. 40. *Fig.* 41. *Fig.* 42.

Figs. 40–42.—Thomas's Splint with extension in Fracture of the Femur in the Newly Born.

Fracture of Neck of Femur.—Walker,[4] of New York, after an investigation of 112 cases of fracture of the neck of the femur, comes to the following conclusions: (1) Fracture of the neck of the femur occurs under fifty years of age more frequently than was formerly believed. (2) Any injury to the hip followed by disability should suggest the possibility of a fracture of the neck, and requires an expert examination, aided by an X-ray photograph. (3) Reduction of the deformity with complete immobilization of the fracture by means of a plaster bandage is advisable during the

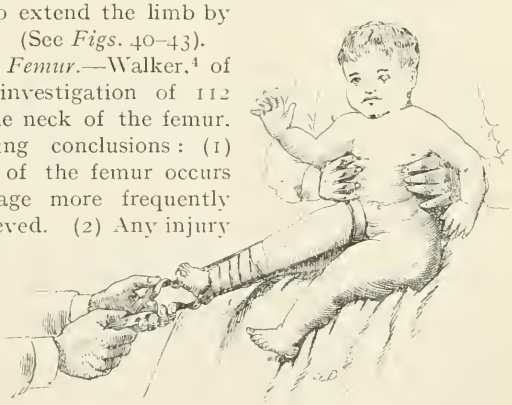

Fig. 43.—Extension of the limb in Fracture in the Newly Born.

period of repair. (4) This is to be followed by *early* gymnastic movements, active rather than passive. (5) All weight bearing upon the fracture is to be avoided for from three to four months.

Bryant[5] reports a case of fracture of the surgical neck of the femur with inversion of the limb. Owing to the rarity of inversion in this fracture, he caused a search of surgical literature to be made, with the result that his assistant found records of forty-four such cases. A table, with essential particulars, is given.

Fracture of Greater Tuberosity of the Humerus.—Ling Taylor,[6] of New York, describes two cases of traumatic separation of the greater tuberosity of the humerus. Isolated fracture has been considered rare, but probably the more general use of the X rays will show that this accident is not so rare as has been thought. It occasionally occurs as a complication of dislocation of the shoulder. In the two cases he describes, one was caused by a fall on the tip of the shoulder and the other by a fall forwards on the outstretched hand in an old lady eighty years of age. There was displacement of the fragment upwards, outwards, and backwards, only moderate in amount. Swelling and ecchymosis, with disability of the joint, are marked symptoms; crepitus may be absent; in uncomplicated cases with moderate displacement, recovery may ensue with bony union without splints or any special treatment.

Fracture of the Patella.—Lord Lister[7] describes a method of dealing with long-standing fractures of the patella. The idea of the method was suggested to him by a case published by Prof. Lucas-Championnière, of Paris, who being unable to get the fragments of the patella into apposition, wired them, nevertheless, and left the wire in as an adjuvant connecting medium. Lord Lister thought that this expedient would gradually stretch the quadriceps by the use of the limb, and the fragments might then be brought into contact by a second operation. The patient on which this method was first used had fractured both patellæ—one four and the other three years before seeing the author; in one knee the fragments were separated about a distance of 5 in. The technique is as follows: Two short longitudinal incisions (*A B* and *C D*, *Fig.* 44) are made over the two fragments (dotted line); they are exposed by a little dissection, and two holes are drilled in the upper one, and then the two ends of the usual stout

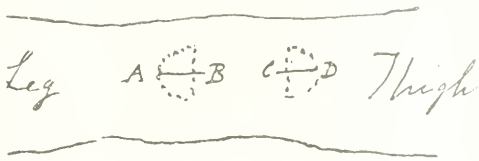

FIG. 44.

piece of silver wire are passed through them from without inwards, so that when the ends are pulled upon the middle of the loop of wire will press upon the surface of the fragment (as in *Fig.* 45). With a blunt instrument (e.g., a broad raspatory) the soft parts lying between the two incisions (consisting only of skin and fat, the muscle being absent) are detached from the front of the femur. A strong pair of forceps are passed from the lower incision under the skin until the blades appear in the upper incision; the ends of the wire are seized and drawn down into the lower incision; two holes are drilled in the lower fragment and the ends of the wire passed through them from within outwards, and after drawing the upper fragment well down, the ends are secured in the usual way and cut short: the result is shown in *Fig.* 46. The skin incisions are brought together by sutures

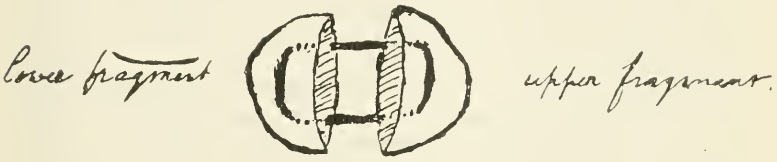

Fig. 46.

and a dressing is applied. In drawing down the upper fragment, Lord Lister found a great advantage from the use of a very strong sharp hook (*Fig.* 47), the point of which was inserted in the tendon of the quadriceps at its attachment. Greater traction can be exerted by this hook than can be done by simply pulling upon the wire, and in order to relax the quadriceps as much as possible the limb was placed in the vertical position before the fragment was pulled down. The limb is dressed and placed in a trough of Gooch's splinting, which is applied to the limb in the elevated position, and the same attitude is maintained as the patient is removed to the ward, and continued by attaching the end of the splint to a rope connected with the tripod and pulley used in applying Sayre's plaster-of-Paris jacket. After three or four days the rope is slackened to allow the end of the splint to come down an inch or two; this is repeated every two or three days until the limb can be placed horizontally. After some time the second operation is performed: the lower cicatrix is opened, the wire withdrawn, and interrupted wire sutures are placed in the tracks of the other one; the edges of the fragments are freshened, and with the help of the hook and the vertical position, the fragments are brought into apposition. In one case where the upper fragment was small, the wire in the first operation was introduced through the quadriceps tendon.

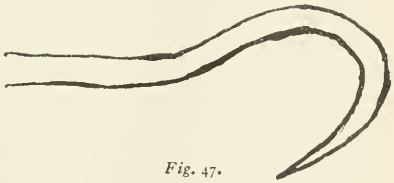

Fig. 47.

Lynn Thomas[8] records a long-standing case of fractured patella where he was unable to bring the fragments into apposition by mobilizing the lower fragment. He made a long curved incision well down over the shin, and chiselled off the tubercle of the tibia with the ligamentum patellæ attached to it from without inwards, care being taken not to detach the tendinous and periosteal attachments along its inner edge. By forcible traction upon the lower fragment of the patella and its ligament the fragments were brought into contact, and their bared surfaces kept in apposition by means of two loops of silver wire. The tubercle of the tibia retained considerable strength of anchorage in its displaced position by means of the untorn fibrous attachments of the ligamentum patellæ along its inner side.

Arbuthnot Lane,[9] in cases of fractured patella, employs a plate with two or more screws. The screws are half an inch long and threaded up to the head. He considers these retain the fragments in position better than wire.

Corner[10] has a communication on the study of 504 cases of fracture and re-fracture of the patella treated in St. Thomas's Hospital. When the bone is broken by indirect violence, the fracture may be in three situations—in the upper part, about the centre, and in the lower part. Corner concludes that the lower is the weaker part. Of the 504 cases, 73 per cent were males and 27 per cent females. More than two fragments resulted in 10 per cent of the cases; four fragments were found three times. The fracture was compound in rather under 1 per cent of cases, the greater number of which were refractures in which the operation scar had become adherent and torn at the second fracture of the bone. Of late years operation has been more freely practised: in 1900, 43 per cent of cases, and in 1907 84 per cent. The patella is the bone of the body which is by far the most often refractured. If it occurs after wiring it happens as a rule within a year of the operation, but if after treatment by splints or massage, it takes place more than a year after. The explanation is that those who have had their patella wired are allowed to use their limbs freely long before those who have been treated by splints. The wire or suture is only an internal splint, the final result depending on the union between the bones, and not on the wire. It is very important to prevent the patella becoming adherent to the femur; in fact, the great and only benefit operation confers is *Early Use of Massage and Movement.* Refractures most often occur in those cases in which the movements of the knee have not been perfectly recovered, especially if the movements of the patella on the femur are not free.

The various factors which will aid the patient to recover perfect movement in his joint and obviate the danger of refracture are: (1) Early operation. In fractures due to indirect violence the skin is not bruised and its vitality is not impaired. Operation should therefore be undertaken as early as possible, say twelve hours after the injury, when all bleeding has been stopped. (2) All blood-clot

and other foreign matter must be removed from the joint. (3) After suture of the fragments, the torn lateral expansions on either side of the patella must be united with sutures. Special care must be taken when the lower fragment is very small, because it may be tilted so that its broken surface looks forward and its articular surface to the broken end of the upper fragment. (4) Gauze and collodion dressings are best, with no splint or the limb flexed. (5) Gentle movements and massage should be begun a day or two after operation, and slowly increased in power and extent. Particular attention should be paid to moving the patella laterally on the femur. (6) All wounds must heal by first intention. (7) The patient should not bear weight on his foot until after *full* movement has returned to the joint—probably from four to six weeks.

It is desirable to avoid a scar over the front of the patella for two reasons: (1) The reparative inflammation within and beneath it will cause sufficient pain and tightness to interfere with the massage and movement; (2) The scar may become adherent to the bone, restricting movement, and possibly leading to a compound refracture.

The period at which fracture most frequently occurs is between 30 and 40, and the next most frequent period between 40 and 50.

A study of the results of suturing fractures of the patella has demonstrated the following points: (1) That internal splints lead to absorption of the hard substances of the bone round them. (2) This leads to loosening of the internal splint and to its breaking more easily with a sudden effort, and to some separation of the fragments. (3) With the early practice of massage and movements the fragments are still further separated, and the union between them is fibrous, not bony. (4) A perfectly good functional limb is obtained with such a fibrous union; bony union is quite unnecessary to an excellent result. (5) Limitation of movement after the fracture is caused by the adhesion or cicatricial contraction of the attachments of the patella to the femur, putting the quadriceps femoris at a mechanical disadvantage. (6) The advantage of direct and internal splintage (suture of the fragments) lies in its allowing movements of the joint to be begun early, preventing any limitation to the movements of the patella on the femur. (7) If the patella is freely movable on the femur it does not matter whether the union between the fragments is bony or fibrous. (8) The nature of the internal splint does not matter: silver, copper, or iron wire may be used, or silk. An absorbable suture is not a good internal splint, because its presence will be required for some weeks at least. (9) A wire is always loosened, even if bony union takes place between the fragments. There does not appear to be any advantage in using two wires. (10) Treatment after operation must be directed to getting a movable knee-joint and a patella freely movable on the femur. (11) For success the operation area must not suppurate. (13) If operation is to be undertaken, it should be done as soon after the accident as is convenient, and before any reparative inflammation has stiffened the torn

structures and increased the difficulty in bringing the fragments together and in moving the joint afterwards.

REFERENCES.—[1]*Lancet*, Mar. 2, 1908; [2]*Brit. Med. Jour.* Mar. 28, 1908; [3]*Ibid.* June 6, 1908; [4]*Ann. Surg.* Jan. 1908; [5]*Surg. Gyn. and Obst.* Feb. 1908; [6]*Ann. Surg.* Jan. 1908; [7]*Brit. Med. Jour.* Ap. 11, 1908; [8]*Ibid.* May 16, 1908; [9]*Clin. Jour.* June 17, 1908; [10] *Pract.* Oct. 1908.

FRACTURES, THE MODERN TREATMENT OF.*

Prof. J. Lucas-Championnière.

No branch of surgery has developed more slowly than the treatment of fractures. Its governing principles date from the dark ages, and yet, to judge from books, they are so firmly established as to be incapable of modification.

In every age, the power to set broken bones has been assumed, first by quacks, and then by regular practitioners; the power, that is, to put them in position—to reduce fractures—and then to make sure of their healing by fixing the limb. These principles are so universally admitted that no one ever thinks of the mending of broken limbs without this double method of treatment. One of our most distinguished anthropologists, M. Manouvriez, finding in a cave bones which had been the seat of repaired fractures, concluded that men of the stone age had risen to the surgical conception of fixation by apparatus: the possibility of repair apart from such means did not occur to him.

During the nineteenth century, the practice of immobilization was increased by the invention and diffusion of fixed apparatus. Hardly a fracture escaped their agency. At a period nearer to our own, a new form of the fixation principle was perpetrated, viz., bony suture. The great argument of those who use it is not merely that of the need of restitution of the shape of the bone—an idea as fallacious as that of fixation—but chiefly that by means of suture fixation can be rendered absolute.

The whole treatment of fractures has thus been reduced to a physical matter; *reduction of the fracture* with *restitution of shape*, then *absolute fixation* to allow the bone to mend perfectly.

If, however, the older writers be consulted, it will be seen that clinical study was not always imperfect, but that they had some idea of conditions favourable to the vitality of the broken bone, that they saw that fixation was not a cure-all, the one thing needful to osseous repair.

Yet no one had the courage to assail the orthodox view of the necessity of fixation. The surgical treatment of fractures stood still, therefore, until the present writer was able to show that methodical movement is essential to the production of the best results in fractures

* A complete account of the method outlined in this article is to be found in "The Treatment of Fractures by Massage and Mobilization," a volume of 504 pages, with 64 figures, by Dr. Lucas-Championnière, published by Rueff; and in "Massage of the Limbs," a book of 144 pages, with 101 figures, by Dr. Dagron, of the Hôtel-Dieu School of Massage (Steinheil, publisher).

of the limbs. The principle however was not accepted until fortified with the practical proofs afforded by many years of experience. It is well to describe the series of observations by which the conception of a physiological law and a new method of treatment was arrived at, in order to show what are the necessary conditions of this method, and to justify a practice so paradoxical, and a change not less complete and violent than that brought into operative surgery by the introduction of antisepsis. Doubtless this advance is of more restricted application, yet it affects a large number of patients and a considerable fraction of the practice of surgery. Patients with fractures constitute about one-fifth of the surgeon's field of activity. The writer has shown that *all* fractures ought to benefit from the application of these new principles, while in the great majority of cases fixation is disastrous.

The observations leading to the conclusion that movement of the fragments does not hinder union, but rather favours it, are as follows: (1) The common phenomenon of patients in whom union is delayed even after absolute and prolonged fixation; (2) The frequent observation of patients who, through prolonged fixation, attain bony union, but with their limbs useless and quite incurably so; (3) The observation, on the other hand, of undoubted fractures, which for accidental reasons have never been immobilized, but have nevertheless attained excellent osseous union; (4) Observation of fractures overlooked in patients who were submitted to unseasonable massage, in whom a good result has followed; (5) Observation of compound fractures where, in spite of the oft-repeated movement necessitated by dressings, union has occurred at least as rapidly as in simple fractures treated by fixation.

The careful study of these cases shows that movement not only failed to hinder, but rather favoured, bony union. Feeling confident that absolute fixation was not needful to bony union, while movement promoted it and increased the general vitality of the limb, the writer began to use movements and to get rid of splints. Knowing that after fracture limbs are in a state of lowered vitality exaggerated by fixation, he sought to combine the needful movement with other means of improving the vitality, circulation, and innervation of the parts. This led not only to the giving up the practice of fixation and the adoption of mobilization, but also to the use of a *special massage* for fractures only.

These facts had already been proved clinically by long years of trial when the writer had the good fortune to see his observations corroborated by very precise scientific research. So authoritative a scientist as Cornil, by histological examination of experimental fractures in animals, found that physiological facts justified the abandonment of the orthodox doctrine of fixation of fractures.

Naturally, it was patients with fractures involving joints who suffered most from immobilization, and in whom the evils of fixation and the advantages of movement were first noticed. But the same phenomena were soon evident in all fractures, and little by little the

method became generalized. The writer cannot review all his observations and their variations, but their dates and order must be noted to show that they extended over many years, because otherwise it is not possible to conceive how any surgeon could think of creating so revolutionary a method and upsetting such old-established practices. The long period covered by these observations should alone prove the correctness of the new principle.

In 1866 I saw a case of fracture of the radius with definite deformity in a woman aged 76. She showed me her arm six weeks after the accident; no doctor had seen it previously. From the first day she had set herself to defy pain and to move her fingers. In spite of some deformity union was perfect from the functional point of view. Till she was 78 her wrist was strong, flexible, free from pain, and functionally without fault. Many discussions at the Société de Chirurgie, from 1875, bear witness that from that day I lost no chance of treating fracture of the radius without apparatus, or (in my difficult fight against prejudice) getting rid of the apparatus as soon as possible.

I had before this made another very striking observation. At the outset of my medical studies I was fortunate in being shown by one of my teachers the use of massage in sprained ankle. Yet he, like others, had warned me against those obscure cases in which a fracture of the fibula is regarded as a sprain of the ankle, and becomes thereby exposed to massage which may bring about grave complications. Fortunately I saw an opposite result, and was struck by the very complete and uncomplicated recovery of a patient whom I had carefully observed, who had had massage from a quack. There was a quite obvious fracture of the fibula, which this man had missed. Union took place in spite of the masseur's violence, of the pain endured, in spite even of bony crepitus noticed during massage. That the limb remained in good condition for years I had ample opportunity to note.

These observations led me to use my period of residence (1866–1869) for the study of every case which conflicted with generally accepted ideas, and I tried on every occasion to lessen the use of splints in cases of fracture, for I was deeply impressed with the disastrous result of the immobilizing treatment we were expected to carry out, and which I always tried to avoid.

In 1875, when I began the routine use of Listerism, the treatment of compound fractures was to me, as to other surgeons at that date, an indication for special carefulness. I soon saw (as I said in my *Manual of Antiseptic Surgery*, 1876 and 1880) that movement in no way interfered with the union of compound fractures treated antiseptically. At that time the application of Lister's methods involved frequent movement of the limb. Among others I followed a case of compound fracture of the elbow where, in spite of dressing every fourth day, union occurred with a rapidity which could not have been improved upon by the most absolute fixation.

It was not therefore a chance massage of a fracture mistaken for a sprain that led me to introduce movement and massage: but because my clinical data afforded the basis of a new principle, viz., *the value of massage and movement in promoting osseous union*; for this principle had never been enunciated before.

From 1880 I made use of a large and daily experience at the Hôpital Tenon, where there were many fracture cases, to test the method I wanted to establish, and every year I made headway. I pointed it out to everyone, and trained masseurs and assistants. Two long communications to the Société de Chirurgie in 1886 were based on more than forty thorough observations, and from that year onwards I described the application of my methods to fractures of the radius, the fibula, and soon after to most other varieties.

More than five-and-twenty years' teaching at the Tenon, St. Louis, and Beaujon hospitals, and at the Hôtel Dieu, led the medical profession to adopt this method.

Officially rejected by many professors of the faculty, it has made most headway amongst general practitioners of large experience. In England and America its reception has been especially favourable. At the present day its influence is such that in some fractures no surgeon would dare to say that he had kept up prolonged immobilization, although this is still used oftener than it should be. The general public itself is beginning to realize the drawbacks of fixation, and even in some cases to refuse it. In every country there are surgeons who have adopted this method with scrupulous exactness, basing it on the principle that a certain degree of regular movement favours the union of broken bones.

The fundamental fact that must always be borne in mind is that *a certain degree of movement of the fragments is more helpful to osseous union by formation of callus than treatment by splints*

The facts bearing on this principle are too many to be fully quoted; but let us recall the difference between a bone wound and a fracture. The former, without mobile fragments, is filled up with difficulty; while a fracture, that is to say a solution of continuity with freely movable fragments, is quickly repaired by an excess of bone formation. Not only are the gaps filled, but the whole field of bony injury is included also—a matter of common observation.

Moreover, M. Cornil, working with M. Coudray, noted that experimental fractures in animals were followed by a more abundant formation of reparative bone if the fragments were moved. In young animals, he remarked, this production of bone was so excessive as to form actual tumours. This is merely a repetition of the fact noted some time before in children treated by massage, in whom an excessive formation of callus occurs: the writer had said, "In children massage and movement must be used sparingly, or an excess of callus will form which will later have to undergo resorption—sometimes a slow process." There are a number of facts that would help to prove the truth of this fundamental postulate: "A certain amount of movement favours bony reproduction." Starting from this, the problem of treatment lies in *using only the needful amount of movement*, and further to use *that particular form of movement most conducive to the restitutio ad integrum of the limb*. Therein lies the root of the method of movement and massage applied to the treatment of fractures.

But has this plan nothing to recommend it except its rapid and complete production of new bone? That its advantages are many—as many as the drawbacks of splint treatment—will be clear to every surgeon who carefully studies the morbid physiology of a broken limb.

It has been abundantly proved that the surgeon's efforts at reduction do not generally lead to an exact restoration of the form of the bone. Some degree of bony deformity remains as a rule; yet this does not interfere with restoration of power. Many patients regain power

excellently in spite of obvious deformity. This suggests that that most dreaded deformity, shortening of the bone, is favourable to muscular power rather than otherwise; and also that perfection of muscular function depends less on the exact form of the skeleton than on other fundamental conditions (suppleness of soft parts, mobility of joints, normal tendons, nerves, and blood-vessels, vitality of the limb, muscular power, etc.).

The repair of a broken limb is a much more complex affair than appears at first sight. When it is carefully studied, it is easy to see why the orthodox line of treatment is quite inadequate and contrary to a full clinical experience. As always adopted, it recognizes two principles only: (1) Solution of continuity in a bone means *deformity* and *loss of substance*; (2) By manual reduction of the fracture and the use of splints the shape of the limb, essential to its power, is re-established, and the long period of fixation assures a restoration of continuity, and therefore usefulness, for the limb. But the reduction of a fracture is not really so simple a matter. With rare exceptions, try as we may, the bony fragments are not brought together end to end as surgeons suppose, even though the general look of the limb and its return to usefulness may be quite satisfactory. A distinction must therefore be drawn between "useful reduction" and the "perfect reduction" that is always talked about.

Beyond this there are cases where even relative reduction is useless, nay, further, sometimes dangerous. And again, in some cases reduction comes about spontaneously, or at least through changes occurring in spite of surgical efforts. Finally, some states of deformity are actually favourable to the eventual usefulness of the limb, although the doctor usually strives to correct them. To prove the truth of these statements, examples must be given.

Fracture of a long bone rarely allows of perfect juxtaposition of the fragments. For example, you have reduced a fracture of the leg; the position is good, and the lie of the foot is excellent. When the patient walks, the foot lies well, and you say, "Reduction was perfect." But when you measure the limb you find nearly an inch of shortening. Clearly juxtaposition could not have existed.

Further, apart from all shortening, look at skiagrams of what seem to be perfectly reduced fractures, and you will always find some fault in apposition, even where functional results are excellent. Radiography has therefore introduced a fresh and accurate proof of the proposition which the writer made before radiography was heard of. The practical outcome of this is to set before the surgeon the duty of reducing a fracture and restoring its form and continuity so far as is necessary for the restoration of function. If he does this, the faults of apposition shown to him by radiography will have a relative importance only. The necessity for reduction should not be absolute, even where some deformity is noted. For example, in a fracture of the radius, with impaction, if there is no great backward displacement of the wrist, perfect usefulness of the limb is compatible with deformity.

It is the same with fractures of the neck of the femur when the foot is rotated outwards, while the fragments are immobile by reason of impaction. In the first instance, attempts at reduction would yield almost no cosmetic result, but the pain and general injury would be increased. Reduction is therefore useless; repair, and return of power, are more rapid without it. The second case is even more serious. Efforts at reduction are not only useless but actually dangerous. In old and enfeebled persons (who are liable to such a fracture) bony repair is often difficult; and impaction will have three parts accomplished it, for it allows the limb to return quickly to activity, and thus prevents the atrophy and bedsores which complicate prolonged inactivity. There is, then, warrant for saying that in these cases the practice of reduction is dangerous. I may add that after many years' experience of treatment which leaves impaction alone and gets patients up quickly, I no longer find real danger in fractures of the neck of the femur even in the oldest and least healthy of patients.

There are cases in which no method of reduction, even with violence, can correct the deformity, and in which, if pain and muscular contraction are overcome, the fragments which at the outset were dragged out of their normal position by muscular force find their right position of their own accord, or become so readily movable as to need the minimum of restraint by apparatus to maintain a good position. These results are shown in the highest degree by massage. The two cases most to the point are fracture of the olecranon and fracture of the clavicle. In these, no amount of force will bring the fragments together again. Despairing surgeons, after inventing complicated contrivances which do no good, have turned to the multiplication of sutures. Two or three days of massage are enough to turn these fractures, so difficult to keep in position, into cases where the loosest apparatus is enough to bring the fragments together perfectly. Though this is not so easy to see in the fracture of bones deeply buried in soft parts, as for example in the leg, yet it is none the less true. I have seen many such cases, in which a broken leg, painful, contracted, irreducible, became virtually painless, and kept in position by quite loosely applied apparatus. Therefore, it is useless in such cases to combat deformity by violent traction and powerful contrivances which give unnecessary pain, and excite spasm till the beginnings of osseous union have perpetuated the bad position which is caused by this spasm.

Here, then, we have a number of cases in which the surgeon should not trouble himself about malpositions which will be corrected indirectly by methods quite different from those ordinarily advised.

Let me conclude with the most paradoxical and revolutionary proposition of all. It is a mistake to suppose that the exact restitution of the length of the limb is an essential condition for the restoration of muscular power and usefulness to the limb. My observations have shown me that *some shortening is favourable, rather than the reverse, to muscular efficiency*. All extension and stretching of muscle

tend to render it inefficient and atrophic. Its vitality and power are enhanced by some shortening of the bones upon which it exerts itself. Many resections have taught me that this shortening is beneficial even to muscle already atrophied.

When muscle is in good condition, as it generally is at the moment of fracture, it is likely to be swollen by ecchymosis and congestion, and dragged upon by the displaced fragments. In the midst of this interference with its functions, some shortening of its bony framework gives it a chance to recover its compactness and contractility. It follows, therefore, if a fracture is accompanied by a slight shortening (three-quarters of an inch, for example), the patient is better off, as far as the future of his limb is concerned, if this shortening is maintained. The limb will merely be stronger and more easily re-educated.

These reflections, which have an important bearing on the reduction of fractures, show how great a change surgical opinion must undergo before real progress is made. But though the question of reduction calls for fundamental changes in theory and practice, that of immobilization is another matter. We shall see that this is not only not essential to the restitution of shape, but that in the majority of cases it is actually detrimental to, while movement is actively productive of, repair.

Pain is a prime factor in the treatment of fractures, and inseparably linked with that of spasm. Pain is due to wounding of the soft parts, to muscular tension, and to irritation of nerves by the fragments; but it is also due to muscular contraction resulting from such irritation. It is because of the need for quieting this pain as quickly as possible that fixation has dominated the treatment of fractures. The most elementary observation shows that pain is most quickly alleviated by fixing the broken fragments. But this alleviation is only temporary: for a long time the slightest movement will re-awaken pain, until indeed considerable changes have occurred in the deeper parts. Moreover, even under the best regulated fixation crises of pain arise which depend on muscular contraction, which vary widely in different patients and different fractures, and tend to disappear only after the lapse of a long time. This phenomenon has had a good deal to do with the practice of fixation, not temporarily only, but until all reparative processes are complete. Clinical observation, however, teaches us that these pains, which occur not only at the point of fracture but also at a distance, in muscles, tendons, and joints, can be modified if, after some rest, the joints near the site of injury are cautiously moved. It is surprising how much of such pain can be thus abolished. These facts may best be observed in relation to the shoulder and elbow.

This relief of pain by movement, noticeable also in fractures of the wrist and ankle, is still more definite when it is preceded by careful massage of the soft parts around the fracture and of the muscles in its neighbourhood. In such cases the relief of pain and conquest of spasm

are assured, but with variations, for we must remember that in sensibility to pain individuals differ widely. From an immediate relief to a gradual one taking place in three or four days, every gradation is seen, but, sooner or later, relief comes to every patient.

This alleviation of pain is inseparable from modifications of the vitality of the limb, and is always associated with the disappearance of contractures. Now the influence of these latter, important though they are, is ill understood. The more painful varieties alone, or cramps, are recognized. They are, however, many and various ; some cause excruciating pain ; others are less severe; others are scarcely felt, although they play an active and harmful part in the displacement of the fragments.

The many causes of deformity are too readily forgotten in the treatment of fractures. Crushing or impaction of bone may produce a type of deformity which may be reduced, or left alone with advantage. The violence of the blow which caused the fracture may determine the displacement of the fragments, which being mobile may be further displaced by outside causes (the weight of the limb, external bodies, transmitted movements). The task of correcting these displacements is entrusted either to apparatus or to the mere position of the limb. But there is a third, much graver cause of displacement, " muscular contraction." This is responsible for the most dangerous malpositions, whether the limb be free or tightly bound in splints, and we may say that it is these contractures which above all things hinder normal and complete repair during the treatment of such an injury.

Contraction, impossible as it is to overcome, leads in all fractures to great deformity, for which elaborate contrivances have been invented in vain. A good illustration is fracture of the clavicle, where all useful reduction is prevented by contraction, and for which all sorts of apparatus have been fruitlessly employed.

Now the earliest result of massage is the disappearance of this contraction. Its use is seen to improve the nutrition of the limb, to favour the absorption of the effused blood, and to lessen the swelling. But these changes are gradual and take time, while the disappearance of contractions is almost immediate. From one to three days are sufficient, and the time generally coincides with the disappearance of pain, for the two phenomena are inseparable, painful irritation exciting contraction and contraction causing pain.

Influence of Movement and Massage on the Vitality of the Limb.— Repair of a fracture is a spontaneous process. One might almost say that callus forms in spite of the surgeon ; yet his influence on its formation may be very real, for the rapidity of the process depends on changes in the vitality of the limb, over which he has considerable control. There is blood poured out, there are damaged cells to be regenerated, and effusions which interfere with nutrition and must therefore be re-absorbed. Now, immobility is of all conditions least favourable to the production of these regenerative changes. Stiffness, atrophy, and retraction, closely connected with fixation of a normal

limb, occur in an intensified degree in the presence of injury. For a long time surgeons seemed blind to this fact; but it is so striking that even the man in the street sees it every day. Now movement, for which the limb exists, vitalizes all its components; but beyond this, massage has a potential action upon this vitality, which has never been scientifically defined, though it is clinically observed. Those who are content with an elementary explanation see no more in the effects of massage than the result of mechanical pressure forcing effused material to resorption. But there is no doubt that the action of massage is more complex than has been supposed. Its action on peripheral nerves is evident; anæsthesia undeniably follows a certain kind of massage.

The type of massage, the mode of pressure, the sensations of pressure and nervous stimulation, the quality of the masseur, all play a part worthy of our attention. Massage is neither the simple nor the violent thing that is often employed: its methodical use leads by a little understood process to various results, the principal being anæsthesia of the limbs, increased vitality and re-absorption of effusions, more rapid disappearance of altered cells, stimulation of tissues to functional activity, and a powerful sedative effect on contraction of muscles. In a word, some movement, more or less, and massage, produce changes in the vitality of the limb which end in a repair simpler, quicker, and more complete than is generally realized.

What are the fractures which can and should be treated thus? Only such as those of the external malleolus and of the wrist, which have some connection with sprains, for which massage is "correct" treatment? If this were the limit of its usefulness one could scarcely regard it as more than a surgical practice of slight importance to patients.

Its use should be wider: it must be understood as applicable to all fractures except for special contraindications. I recognize but one contraindication—threatened deformity. It is a permanent fact that in some fractures of the leg or the humerus the least movement exposes the limb to the risk of becoming crooked; it is clear that fixation must be regretfully adopted and maintained as long as is necessary; but as soon as it is evident that there is no tendency to these malpositions, even in the middle of the leg or of the humerus, I have often put splints away and practised daily massage. In these cases it is easy to see repair taking place more rapidly and more perfectly, the soft parts and the joints becoming flexible, and the patient being really cured by the time when ordinarily he would with difficulty be laying aside his splints. But while in these cases repair is simply more active (though this counts for something if you are dealing with fractures involving joints—fractures of the wrist, the malleoli, the olecranon and the elbow, and the upper end of the humerus), you will achieve results beyond all comparison with those of the older methods. At the shoulder, for instance, where the usual result was a more or less established weakness, and after a certain

age the patient was irrecoverably doomed to serious disability, nowadays, even in old patients and in the presence of considerable deformity, the gravity of such fractures is relatively smaller. Fractures with wide separation—those of the olecranon for example—show no separation after the fourth day. That is why I have never sutured the olecranon as a primary treatment. However, in patients carefully treated by fixation such wide separation has remained that I have been obliged to use sutures, a practice never necessary in my own patients. Fracture of the clavicle, which used to be full of difficulties to me as to everyone else, is after several days of massage and passive movement, as easy to manage as any other, by the simplest apparatus.

In some fractures the original displacement is so great as to need reduction ; and then there is such a degree of mobility as may call for fixation. But even in these cases I do not fix the part with apparatus so absolutely and so long as has hitherto been thought proper. Take, for example, fracture of the radius with much deformity. Here I practice reduction ; but every day the wrist is massaged in the hand of the operator (to avoid displacement), and then set in two splints and a bandage. Every day this is taken off for massage. In a week or ten days constraint may be less rigidly enforced, and after a fortnight repair is so advanced that the splints may be replaced by some protective contrivance. After the third week, the wrist can go into action again. This somewhat mixed treatment is not that of all fractures—only of those where a fresh displacement threatens to occur. The surgeon should aim at practising movement without causing displacement.

To discuss this new treatment fully, we should have to consider every fracture. Unlike that by fixed apparatus, this method has no common application for all cases. Each demands its own special treatment, based always on movement and massage. The difficulty lies in this individual application, so different from the routine use of the fixation method. Fixation gives miserable results, but it is easy to carry out, and can be turned over to a hospital attendant. It is quite otherwise with the mobilization treatment, the results of which are miraculous as compared with those of fixation. But the practitioner must be careful and well taught, he must learn how to use movements, how to reckon with the causes of deformity, and of the paresis to which the great majority of medical men still doom their patients.

It is not merely during treatment that the sufferer benefits by movement. The disappearance of the pain secondary to fracture is one of its best results. Every surgeon who has treated fractures knows how often the limb is left ill-nourished and painful. Nutritional changes, œdema, alterations in the skin, wasting of muscles, are infinitely less serious after treatment by movement. It is to be particularly noted, that in patients treated by my method softening of callus is never seen, while it is quite common in those who have been

subjected to rigid fixation. Comparisons are difficult for people seldom have two fractures in a lifetime, and very rarely indeed get two at the same time for the simultaneous testing of both methods. Yet the newer practices have been so often used as to warrant a firm conviction that a real difference exists. There is one very striking fact with regard to secondary pains—their relative rarity and curability. Long after fractured limbs have been set free from splints, pains persist and even appear anew, certainly to a larger extent than surgeons generally recognize. It is the family doctor who hears all the grumbles. Many of these people patronize the warm-water spas, and among the poor there are many who are kept from resuming work by such pains. In patients treated by mobilization there is such a difference in this matter of secondary pains that if they complain of discomfort during passive movement I tell them that I am sparing them future pain. This reduction of later pain is such that even when the movement treatment is badly executed (as I have often seen it), even when it is practised by masseurs who, pretending to use an art they do not understand, give the patient excruciating pain—even in such unfavourable cases the final result is satisfactory.

This success was easy to foresee in the light of certain facts which led me to evolve my method. I recalled results obtained by quacks who had massaged fractures without knowing it, jockeys who went on with their business freely in spite of broken collar bones, medical men who either by chance or mistake treated fractured clavicles without fixation. When excellent results were obtained even in such cases, we had reason to hope that movement methodically applied would yield results better than had ever yet been attained in the treatment of fractures.

Comparison of Treatment by Passive Movement with other Treatments of Fracture.—When I published my method I had principally to compare it with that of fixation run to death, as it was taught us. The rule was to prolong fixation as long as possible beyond the necessary minimum. Anyone who doubted was treated to ceaseless quotations from Dupuytren, whose words were preached like Gospel truth; his teaching was to maintain the use of splints for months and months. Anyone discerning danger to joints in this prolonged fixation was dubbed an "ankylophobe," as Verneuil called me at the Société de Chirurgie.

To-day it is not quite as bad; things have changed a little, and for twenty years the treatment of fractures has been very different. Those who call themselves eclectic surgeons have to a great extent "watered down" the wholesale fixation method. Some of them have gone further, and really fancy that by adding movement at a later stage, with more or less systematic massage, to their usual treatment, they have adopted my methods. It is with this as with all eclectics. This is not my method, and, since it is not, it cannot hope for such results as mine. Doubtless something is gained, and this something will perhaps make surgeons less unwilling to go all the way. They can now

get less stiffness and less secondary pain ; but their treatment still continues to make evils in order to undo them later, while mine aims at preventing these evils altogether.

If you begin directly after the accident to restore cellular life, to prevent muscular atrophy and stiffness of tendons and ligaments, if you give your help to the vitalization of tissues which need it, you can easily see what effect this will have on prognosis. But there is yet between these surgeons and ourselves so great a gulf that they still worry about the gravity of fractures involving joints, and talk of the suture of bones (the olecranon, the elbow, the upper end of the humerus). You still see them putting splints on malleolar fractures which have no tendency to displacement. Yet our motto is simple enough : *as soon as there is no risk of displacement, take off all splints.* If displacement indicates some degree of fixation, there are plenty of means for practising movement and daily massage with the help of splints, etc., that can be taken off.

Contrivances Applicable during Walking.—In the special case of fractures of the leg, real progress has been made by apparatus for walking. But this has its special indications, and cannot replace treatment by methodical movement ; in fact it can only be applied to such cases as are particularly suitable for treatment by the newer methods. It is impossible and even dangerous in cases with much displacement. The great advantage is that the patient can get about from place to place and undertake certain kinds of work ; but as far as the perfection of repair is concerned, it is not much better than fixed apparatus, for movement at some joints must be restricted and stiffness will ensue. Such apparatus cannot therefore yield ideal results.

Immediate Suture of Broken Bones.—There is a tendency at the present day to use various forms of suture for the immediate reunion of fractures. The severity of this method is against it, and also the slowness of repair. No one can dispute its gravity. This is, I believe, due to the use of so-called " asepsis " instead of a thorough antiseptic technique. But its great drawback is delay in repair ; this will be doubted by no one with a wide experience of the method. Bones joined by suture solidify more slowly than those brought together in the ordinary way. The use of sutures involves that of fixed protective appliances, and in the end the result is nothing like so good as that yielded safely and easily by the movement method. Suture is indicated in cases where nothing else will bring the fragments together. The interposition of soft parts may be prevented by it, but it cannot claim superiority as a routine treatment. Let me show, by illustration, my point of view with regard to bony suture. I use it for fracture of the patella because no other method can possibly bring the fragments together so well. I suture neither clavicle nor olecranon because better and quicker results follow movement and massage. Sutures applied later are particularly suitable for cases where bad treatment has left deformities to be corrected.

Conclusions.

From this account we must conclude that the treatment of fractures is ready for sweeping change by methods the dominant factor of which is systematic movement. As all fractures are not the same in regard to mobility and displacement, they need to be classified as follows :—

1.—*Fractures which should be so treated at once, together with simple enclosure within appliances, without efforts at reduction and the use of fixing apparatus* : Simple fracture of the radius ; fracture of both bones of the forearm ; fractures involving the elbow-joint ; fracture of the olecranon ; the majority of cases of fracture of the upper end of the humerus ; fracture of the clavicle ; fracture of the scapula. In the lower limb : Fracture of the foot ; fracture of the malleoli without displacement, (i.e., the majority of fractures of the fibula and a large number of those of both malleoli) ; some fractures of both bones of the leg ; fracture of the upper end of the tibia ; certain fractures of the lower end of the femur without displacement (vertical fractures) ; all fractures of the femoral neck.

2.—*Fractures which should be treated by massage and passive movement after reduction with the temporary use of fixation apparatus* (generally of detachable fixed apparatus allowing of daily manipulation) : Fractures of the radius with great displacement ; fracture of both bones in the forearm ; fracture of the elbow simulating dislocation, especially in children ; some fractures of the humerus without displacement. In the lower limb ; Many fractures of one or both malleoli, and some fractures of both bones of the leg may, after necessary reduction, be treated in the same way.

3.—*Non-detachable Apparatus* is to be reserved for fractures of the leg where displacement returns too readily, for malleolar fractures which are difficult to reduce, for humeral fractures with great mobility. In children, considering the difficulty of treatment, such appliances may be used for a short time for fractures of the shaft of the humerus, for those of both bones of the forearm, and for fractures of the leg ; because children suffer less through loss of movement. But even in a child, an articular fracture, for example one implicating the elbow joint, should not be subjected to absolute fixation for more than a week ; and even in this special case treatment by mobilization is to be preferred wherever the fixation period can be shortened.

As for fractures of the shaft of the femur, I think that extension apparatus fixed below the knee (Hennequin's method) gives the best conditions ; and moreover it allows of massage and passive movement.

Essentials to be Observed.

There are certain facts and essential conditions to observe, of which the majority of surgeons know but little ; yet to apply the modern method of treating fractures these must be insisted upon.

Examination of the fractured limb should never be violent ; it should cause little if any pain. Every painful manipulation makes

treatment more difficult, for it aggravates that muscular spasm which is responsible for the worst deformities. Limited movements soothe rather than increase the pain. Deformities dependent on contractures must never be forcibly corrected. As for other deformities, before correcting them we ought to be sure that there is no good reason for letting them remain. During the examination a little passive movement relieves the pain rather than otherwise. After the first examination, gentle surface massage at a distance from the point of fracture often induces a distinct anæsthesia and makes examination far more feasible than before. If there is impaction of the fragments with moderate deformity, it ought as a general rule to be let alone (radius, upper end of humerus, neck of femur).

In fixing a splint, attach great importance to the position of the limb. This often means a reduction of the displacement, with disappearance of the pain (humerus, clavicle, elbow).

Except in very rare cases (spiral fractures of the leg or of the malleoli) appliances that cannot be removed should not be put on immediately.

From the first day massage should begin, at a distance from the fracture. It must never cause pain. The first time it should take fifteen or twenty minutes. Even in those cases where a non-removable appliance may well be used at the end of a few days, the massage which gets rid of the pain often abolishes muscular spasm, together with a large proportion of the deformity for which the apparatus is applied. Each massage should be followed by movement of the neighbouring parts, varying according to the particular conditions of the case. If the fragments move freely at the point of fracture they should be fixed by the hand while passive movement is practised. If they are somewhat less mobile, fuller movement of all the joints concerned is permissible ; and if less mobile still, a degree of active movement may be advised, care being taken to note that no harm is done.

The apparatus applied varies much, though massage and movement are applicable to all cases. It may be solid throughout (some fractures of the leg, the upper arm, and the forearm). It may exercise a slight constraint only ; for instance, padded and rolled bandages, trough-shaped metallic splints with padding (fractures of the leg, the malleoli, the wrist, and of both bones of the forearm). It may be used to fix the limb in one settled position (fracture of the clavicle, of the upper end of the humerus, of the elbow). Speaking of these appliances, it may be remarked that in many cases, after a few days of massage and passive movement, the minimum of restraint is needed to keep in good position fragments which were at first apparently hopelessly displaced. Again, the fixity of the fragments very soon becomes such that we can no longer displace them—much sooner than we used to think. This is because callus forms more rapidly, and it enables us to make an end of fixation of the fragments as soon as it ceases to be useful. To get such results every time, however, certain conditions must always be observed. Our manipulations throughout, as at the beginning, should cause no pain ; they should be gentle and prolonged.

They should be progressive: superficial at first, then deeper, getting nearer and nearer to the point of fracture. The first movements should be passive only; from these only can we gain a knowledge of the condition of the parts.

The patient is to be asked for active movement in a slowly increasing series only, at first with the sole purpose of teaching him that his pain is getting less. For some fractures with a great tendency to displacement, active movements are absolutely contraindicated; but as a general rule every surgeon who knows how to re-educate the muscular functions will find active movements useful. The essential thing in movement of the joints is to get all their movements done. That these movements should have a wide range is far less important; it is even better that their range should be limited. If movement has been practised early, a wide range can always be acquired later. Wide movements at the outset are inconvenient because of the useless, harmful pain provoked, and the risk of displacement.

Deformities due to the shape of the fragments should be corrected as early as possible. The commoner and more serious ones will be easily and spontaneously corrected after a few days' treatment.

Fixed apparatus will not often be needed. Its ordinary uses are to get a good position, to ensure, by gentle control, a safety from untimely movements; or something may be used which, while exercising a firmer control, can be taken off daily. Under these latter conditions, the patient may at the end of a short time be given all possible freedom.

While apparatus is in position, active movements without supervision have certain advantages, but they are not without their drawbacks. The surgeon had better direct them, and forbid such as tend to alteration of shape in spite of the apparatus. This is very important in regard to fractures near the wrist and ankle, and indeed near most joints. It is a point to be insisted upon, for some surgeons imagine that it is good practice to allow and even encourage active movement, and they have actually noted that the best results of all are obtained by letting the patient use his broken limb. This only shows that movement is so valuable a thing that even when dangerously used it is more capable of good results than fixation. But if movement is to be considered a useful therapeutic asset, free from danger and preferable to all other methods, the patient's smallest movements must be directed and measured. The man who without foresight leaves his fractures to the mercy of the least of such movements makes a mistake.

Movement must be used, like other therapeutic agents, in measured doses.

FUNICULITIS, EPIDEMIC. *J. W. W. Stephens, M.D.*

A. Castellani[1] describes this affection, which has been well known in Ceylon for many years. The disease is also known as phlebitis of the spermatic cord, or corditis. The onset is sudden, with shivering, high fever, vomiting, etc. The inguinal region is occupied by a large

cylindrical swelling in the direction of the cord ; it is tender and hard ; the skin is not affected. Pathologically the cord is found to be three inches in circumference, and on cutting into it pus exudes from the vas deferens and from the pampiniform plexus. The pus contains a diplostreptococcus. The treatment is surgical—sectioning the cord as high as possible,—as if not operated on, septicæmia usually sets in.

REFERENCE.—[1]*Lancet*, June 4, 1908.

FURUNCULUS (Possible Cause of Retinitis). (*See* RETINA.)

GALL-BLADDER, SURGERY OF.

John B. Deaver, M.D., LL.D. / *Astley P. C. Ashhurst, M.D.* — *Philadelphia.*

This brief review cannot be inaugurated better than by quoting the initial paragraphs of a thoughtful paper by Charles B. G. de Nancrède.[1] He says, "My attention was recently called to the views apparently held concerning cholecystitis and gall-stones by the rank and file of the profession, by a remark of my chief of clinic, 'that the general profession at present seems to occupy the same position towards biliary surgery that it did ten years ago toward appendicitis.' I am satisfied," the writer continues, "that this is largely true, and that the real importance of certain biliary conditions, and the impossibility of successfully dealing with them otherwise than by the knife, is not widely enough recognized." He calls attention to the prevalent belief "that to warrant a diagnosis of cholecystitis some jaundice should be present, and that a painful tender tumour in the region of the gall-bladder should be demonstrable, with possibly chill, but certainly marked fever ; while the failure to detect jaundice seems to many, unavowedly, to unsettle their tentative diagnosis as to the possibility of cholecystitis." He then narrates the case histories of numerous patients with cholecystitis, cholangitis, and other complications, and states that one must be struck by the absence in these notes of many symptoms usually deemed to be almost universally present in the classes of cases described. He found, however, that though jaundice existed at some time in about 75 per cent of his patients, it was sometimes declared by the medical attendant to be still present when it was patently absent to Dr. Nancrède's own eyes. In only about one-third was the jaundice practically continuous, and of this one-third more than half were not cases of biliary lithiasis. Calculi were absent in about one-third of the whole number of patients.

Studies such as the above are valuable if they succeed in impressing upon the "rank and file of the profession," as it is called by Nancrède, that the so-called classical symptoms of gall-stone colic and of cholecystitis are really the exception rather than the rule, and that modern surgery has shown the existence of many serious lesions, which would be fatal without operation, in patients presenting few of the classical symptoms.

A note of warning is sounded by M. H. Richardson,[2] who writes "On Some of the Difficulties and Dangers in Surgical Operations upon the Biliary Tract." He decries the habit of reporting only successful cases, and bluntly calls attention to some of his own failures. He regards biliary surgery as difficult, both in diagnosis, prognosis, and in operative treatment. He lays stress on the value of the clinical history of the patient, believing that the surgeon is less easily led astray by this than by the subjective symptoms of the patient; but he adds, "History taking and weighing requires better judgment, more experience, higher intellectual powers, than the physical examination." And owing to the uncertainties of diagnosis, he holds that any surgeon who ventures to enter the field of biliary surgery must be equipped for gastric, pancreatic, and intestinal work. He thinks *jaundice* is the most unfavourable factor in the prognosis, and the *overlooked stone* is the cause of almost all the catastrophes which follow operation. He recognizes, however, that the failure to remove all the stones is sometimes unavoidable; he knows that he has overlooked many stones himself, but he does not know at the time of operation that other stones remain, else he would remove them. Yet in one case, in dislodging a stone from the common duct, he allowed it to escape into the hepatic duct, and he found himself absolutely impotent to find it again: "there was the patient with his common duct wide open, and somewhere in the depths of the liver was the offending stone, ready to be drifted down into the same impaction as before. The operation was absolutely useless. There was no way of going further in attempts at extraction: the patient was seriously shocked, and, in fact, died later." He regards cholecystectomy as a difficult and dangerous operation, and thinks the denuded liver surface responsible for most cases of post-operative hæmorrhage. Yet, he says, "a gall-bladder or a cystic duct that is more than moderately pathological should be removed." But, "were not the common- and hepatic-duct operations usually undertaken for gall-stones causing obstructive jaundice, I believe that choledochotomy would be safer than cholecystectomy, because the latter operation wounds more or less extensively the liver substance, and requires perhaps even more dissecting about the foramen of Winslow."

Pathology.—John B. Deaver,[3] in reporting the results of 217 cases of gall-bladder surgery, covering his operations from 1903 to 1907, discusses the origin and pathology of infections of the biliary passages, with special reference to cholelithiasis and cholecystitis. Though it is freely admitted by all surgeons to-day that these diseases are due to infection, the route by which the infecting matter reaches the gall-bladder and ducts is not certainly known, though modern opinion tends to the belief that it occurs by way of the portal system, and that when the liver's physiological functions as a bacterial filter are overtaxed, some of the bacteria pass through into the bile-ducts, and so may reach the gall-bladder.

Typhoid fever, as one of the more important sources of such an

affection, has of late received special attention. Of 182 patients with calculous cholecystitis under Dr. Deaver's care, fifty-one (28 per cent) at some time or other had had typhoid fever. In one patient the *B. typhosus* was recovered from the gall-bladder forty-one years after the acute infection. The same bacillus was recovered from the gall-bladder of four patients in whom no history could be elicited of any acute invasion of the intestinal tract resembling typhoid fever. Among the 182 cases of cholelithiasis, cultures were made in ninety-four, of which there were: sterile forty-six, *B. coli* in twenty-five, *B. typhosus* in thirteen, *Staphylococcus pyogenes* in five, unidentified three, *B. coli* and *Staphylococcus* in two. *B. subtilis* was found within calculi in one other case. In the cases where the cultures remained sterile it is probable that the original infection was by an attenuated organism. In the thirty-five cases of non-calculous cholecystitis, acute and chronic, cultures were made in eighteen; six (33·3 per cent) showed *B. coli communis*; twelve were sterile.

The following table shows the location of the calculi :—

		Simple cholelithiasis	Cholelithiasis and cholecystitis	Simple hydrops	Cholelithiasis and abscess	Cholelithiasis and carcinoma
Gall-bladder alone ..	107	62	34	3	5	3
Gall-bladder and choledochus	24	17	6	0	1	0
Gall-bladder and cysticus	26	11	9	6	0	0
Gall-bladder, choledochus, cysticus ..	2	1	0	1	0	0
Gall-bladder, choledochus, hepaticus ..	2	1	0	1	0	0
Choledochus only ..	12	9	3	0	0	0
Cysticus only ..	6	2	2	2	0	0
Gall-bladder, cysticus, choledochus, and hepaticus	1	1	0	0	0	0
Choledochus and hepaticus	2	2	0	0	0	0
Total gall-stone cases	182	106	54	13	6	3

From a study of these figures, Deaver concludes: (1) In cases of hydrops there was either a stone in the gall-bladder only, or in the cystic duct, at times with associated stones in the gall-bladder and choledochus. (2) In the vast majority of cases the calculi, even when causing symptoms, are found in the gall-bladder alone. (3) The rarity of finding stones in the hepatic duct indicates that calculi usually originate in the gall-bladder itself. In one case a calculus was found in the duct of Wirsung, there being also stones in the gall-bladder, choledochus, and hepaticus.

Empyema of the gall bladder was found in thirty (16·4 per cent) of the 182 cases of calculous cholecystitis, hæmorrhagic cholecystitis in two cases, the ulcerative form in ten (5·5 per cent) and gangrenous cholecystitis in seventeen (9·4 per cent). Hydrops occurred in thirteen (7·1 per cent).

Among the more serious *complications* of biliary surgery Deaver encountered two fatal cases of acute *cholangitis* with *hepatic abscess*, following operation. Pericholecystic *adhesions* were present in 107 of the cases of calculous cholecystitis, or in over 58 per cent. "The importance of adhesions of the upper abdomen has not been as fully appreciated as is warranted by the symptoms to which they undoubtedly give rise. Indeed, in many cases the symptoms and gravity of gall-bladder lesions are due not to them *per se* but to the accompanying adhesions. It is easy to understand how by traction upon the pylorus or duodenum symptoms of obstruction of the pylorus can be, and are, simulated, and this is doubtless the explanation of many of the cases in which vomiting is such a persistent and grave complication."

Two cases of *internal biliary fistula* were encountered—one cholecystogastric, and one cholecystoduodenal. In a subsequent series of seventy-two operations on the bile passages, Deaver encountered a second case of cholecystogastric fistula spontaneously established. There were also two cases of *carcinoma* of the gall-bladder. He states that he has not been able to confirm the theory that the existence of *pancreatitis* leads to more severe hæmorrhage than when this affection does not complicate the biliary lesions.

Symptoms.—In the series of 182 calculous cases Deaver found *jaundice* present at some time or other in nearly 70 per cent of his patients; over 40 per cent had jaundice at the time of operation. *Chronic indigestion* was noted in 24 per cent of patients. In the non-calculous cases over 34 per cent had jaundice at the time of operation, while only 20 per cent had never had jaundice at any time. In 65·4 per cent a history of colicky pains was obtained. 25·4 per cent had had chronic indigestion, and pancreatitis was present in 14·3 per cent (five cases).

Treatment.—Deaver sums up the indications for surgical intervention thus: (1) Repeated attacks of biliary colic; (2) Hydrops of the gall-bladder; (3) Stone in the common duct; (4) The existence of any of the complications, especially of the acute infections. The results in 217 patients operated on were as follows: General mortality, 13·8 per cent (30 patients); these deaths were distributed thus: of the 182 patients with cholelithiasis, twenty-seven (14·8 per cent) died; of the thirty-five cases of non-calculous cholecystitis, three (8·5 per cent) died. In simple cholelithiasis (forty-five cases) the mortality was 4·4 per cent, and in all cases of stone (except hydrops) in which there was not acute inflammation, it was 10·6 per cent (eleven deaths in 104 operations). In cholelithiasis with acute cholecystitis, ten patients out of fifty-four died, or 18·5 per cent. In cholelithiasis with abscess, two of six, or 33·3 per cent. died. In hydrops three of

twelve, or 25 per cent, died. The nature of the operations in the calculous cases is shown in the accompanying table :—

	Cases
Ideal cholecystostomy in	4
Cholecystostomy in	72
Cholecystostomy and choledochostomy in ..	34
Cholecystectomy in	36
Cholecystectomy and choledochostomy ..	29
Choledochostomy	5
Cysticus drainage	1
Cholecystenterostomy	1
Total	182

The *contra-indications* to operation are summarized as organic lesions of the heart, lungs, kidneys ; extreme age ; anæmia or slow coagulability of the blood ; and cholæmia.

Cholecystectomy.—The indications and contra-indications for performing excision of the gall-bladder have been discussed with unusual animation during the past year. At the meeting of the Surgical Section of the British Medical Association in 1907, the discussion on the subject was opened by Bland-Sutton,[4] who is a well-known partisan of this operation. He takes it as sufficiently proved that many of the severe forms of cholangitis and cholecystitis are secondary to the presence of gall-stones, and that in many cases the dilatation of the common bile-duct by concretions favours the entrance of pathogenic microbes from the duodenum. Stasis of infected bile is the chief cause of the formation of concretions ; and the gall-bladder, he points out, is that portion of the biliary apparatus where calculi are most apt to form. He considers the bile as purely excrementitious, like the urine, and thinks the gall-bladder is of little *functional* importance. He dwells upon the *pathological* importance of the gall-bladder. He recommends cholecystectomy "in the subjoined list, not for every patient who is suspected to have a diseased gall-bladder, but subject to those conditions in which judgment and experience teach us that surgical interference is really indicated." This is his list: (1) Injury to the gall-bladder; (2) Calculous cholecystitis; (3) Acute (non-calculous) cholecystitis and gangrene of the gall-bladder; (4) Mucocele (hydrops vesicæ felleæ); (5) Chronic suppurative cholecystitis (empyema); (6) Biliary fistulæ; (7) Malignant disease (cancer, sarcoma, endothelioma). In arguing from statistics as to the comparative mortality of cholecystotomy and cholecystectomy, he thinks different classes of cases should be recognized, separating acute from chronic cholelithiasis, and making a separate table for cases where choledochotomy and cholecystectomy are performed at the same time ; then other tables should be made for operations for malignant disease, and for those for injury.

He regards it as an axiom that if a gall-bladder "contain concretions it must be considered unsound. It is therefore wise to remove it." He recommends cholecystectomy in every case of empyema; and even in cases where cholangitis complicates the gall-bladder lesion, he urges

removal of the latter, because he regards it as "a loculus imperfectly drained by a narrow sinus, which in other parts of the body the surgeon obviates whenever possible." To those who prefer drainage in this condition he recommends "to try the effect of cholecystectomy, and spare the patient the annoyance and misery of a sinus." Time alone prevented him from considering what he terms "the defects of routine cholecystostomy: the inconveniences of fistulæ—biliary, mucous, or purulent; and the disappointments to patients and surgeons alike—recrudescence of calculi, recurrent cholecystitis, and other minor evils which are apt to follow this inefficient operation." He concludes with the statement that he advocates the almost routine employment of cholecystectomy for disease of the gall-bladder requiring operative treatment; and that a "troublesome gall-bladder requires the same radical treatment which to-day surgeons meet out to a mischievous appendix, and its removal is followed by the same permanent benefits."

In the general discussion which followed there was not a voice raised in unqualified approval of these views. Mr. A. E. Maylard felt that drainage of infected bile was an important feature in the successful treatment of many cases of cholecystitis, and that when the gall-bladder was so treated it could return to its normal state and carry out those functions "which are its natural part to play in the human economy." Mr. Charters J. Symonds acknowledged that his tendency was at present towards the more frequent removal of the gall-bladder (twenty-eight times out of forty-four operations for all conditions), but he could not countenance its employment as a routine procedure. He pointed out that recurrence of calculi was so very rare that it might be eliminated as an objection to cholecystotomy. He moreover called attention to the fact that Mr. Bland-Sutton had given "no account of his cases and no particulars as to mortality," and urged that as cholecystectomy was undoubtedly the more dangerous operation, it was the surgeon's duty not to employ it recklessly. Mr. E. Stanmore Bishop decried the routine removal of the gall-bladder, because it might be extremely useful at the time or in the future to both the patient and the surgeon himself. Drainage, he contended, was the surest method of cure; quite as important, indeed, for ultimate cure as the removal of calculi; and drainage through the gall-bladder was not only more easily procured than by suturing a tube in the common duct, but at a later time the diversion of the bile into the intestine by a new channel, if required, was much more easily and safely accomplished by cholecystenterostomy than by anastomosis between the common duct and the intestine.

Mr. J. D. Malcolm stated that as far as the mortality of cholecystectomy was concerned the operation was "very easy and very safe in those simple cases" in which he thought it unnecessary, and that it only became difficult or dangerous "in those cases in which on account of long-continued inflammation it is important that the excision should be undertaken." And he added that in these serious cases it was often better to drain the gall-bladder first, and remove it "later

on when inflammatory mischief has subsided." Finally, he said, the main desideratum was that operation be undertaken earlier, before the lesions became chronic, since it was chiefly in the latter cases that the more dangerous operation was indicated.

Mr. J. Ward Cousins stated that it is absolutely impossible to decide upon the form of surgical treatment *until the abdomen is opened,* and that in the large majority of cases cholecystotomy with drainage is very safe and efficient.

Dr. Irving H. Cameron, of Toronto, urged the retention of the gall-bladder whenever possible, especially with associated cholangitis and pancreatitis, for the purpose of drainage. "Mr. Bland-Sutton's position to-day," he said, "is precisely that assumed by Mr. Lawson Tait twenty or twenty-five years ago upon the subject. . . The score of years which have intervened have served to show in the experience of many surgeons that Mr. Tait's position was fallible and erroneous, and I predict the like result for Mr. Bland-Sutton's present position when five-and-twenty years are overpast." He called attention to one use for the gall-bladder after cholecystotomy, which probably had not occurred to anyone present, namely, instead of the stomach or the rectum for feeding a patient when these other structures became rebellious.

Dr. W. L. Rodman, of Philadelphia, while agreeing with Mr. Bland-Sutton in preferring cholecystectomy for injury and gangrene, said that for hydrops disease he preferred cholecystotomy.

Mr. Bland-Sutton, in closing the discussion, pointed out that though any individual surgeon may have seen only two or three examples of stones met with in the gall-bladder long after cholecystotomy, yet the aggregate of these cases is large. He thinks the discussion clearly showed that several surgeons now from choice perform cholecystectomy more frequently than cholecystotomy; and that "a study of periodical literature indicates in no uncertain way that cholecystectomy is swiftly gaining ground," and that "this discussion will have a great influence in promoting this desirable result."

Three weeks later Mayo Robson[5] published a paper on "Cholecystectomy: the Indications and Contra-indications for its Performance." Out of nearly 1000 operations on the biliary passages, he has performed cholecystectomy only ninety-four times for various diseases. Mayo and Deaver each adopted this operation in about one out of every three cases. In regard to the danger of reformation of gall-stones if the gall-bladder be not removed, Robson states that in the very large experience of Mayo, Kehr, and himself, whose aggregate of operations on the gall-bladder amounts to over 3000, "it has been stated by each separately that the recurrence of gall-stones after-cholecystotomy is an extremely rare event." And Robson further states that he has known calculi to develop in a dilated common duct on several occasions after cholecystectomy had been performed by various operators. In regard to the physiological value of the gall-bladder, he calls attention to experiments by himself which showed

that about 72 cc. of mucus are added to the bile in twenty-four hours by the secretion of the gall-bladder, and to experiments by Dr. Flexner which showed that pure bile, when injected into the pancreatic ducts, sets up acute pancreatitis, but that the addition of mucus to the bile renders it much less irritating. He suggests that time may show that the abolishment by excision of the storage function of the gall-bladder may eventually result in hepatic cirrhosis, and states that he has had to operate for interstitial pancreatitis developing after cholecystectomy. The fear of a biliary fistula persisting after cholecystotomy is not great if the ducts have been properly cleared of stones. Although he has had only one death in his last fifty-seven cholecystectomies, he realizes that it is a more difficult operation than cholecystotomy, and that if the former were to become the routine procedure, the death-rate from gall-stone operations would be greatly increased.

John B. Deaver[6] also gives "Some of the reasons why Cholecystectomy should not be performed as frequently as is advocated by many surgeons." After dwelling upon the functional value of the gall-bladder as a reservoir, evidenced in his experience by the *vis a tergo* of the bile current which opens up the stump of the cystic duct, unless very securely ligated, after cholecystectomy, and shown by the occasional development of a diverticulum from the cystic or even the common duct, to replace the gall-bladder, after its removal; he proceeds to point out its value as a reservoir during the longest period between meals, at night. "I have sometimes thought that perhaps the reason that persons with gall-bladder affections sleep better after a late supper than might be expected of persons in their condition, is that the process of digestion keeps the gall-bladder more or less empty of bile, and that thus the presence of the lesser evil procures less disturbed sleep." He notes the difficulty which frequently exists of finding the common or the hepatic ducts without the gall-bladder as a guide, and urges that it be left in the patient's abdomen for use in an hepatic emergency should such ever arise later. The greater liability of trouble from post-operative adhesions when the gall bladder is removed, he thinks another reason for its retention. Cholecystectomy he thinks indicated in: (1) Hydrops with obliteration of the cystic duct; (2) Malignant growths; (3) Calcareous degeneration, gangrene, and perforation of the gall-bladder; (4) Chronic empyema. Traumatism of the abdominal wall with rupture of the gall-bladder has occurred twice in his experience; in neither case was it necessary to do more than drain. He concludes with the statement that he is less inclined to remove the gall-bladder the more gall-bladder surgery he does.

Choledocho-enterostomy. Andrew Fullerton[7] reports an instance of this unusual operation undertaken for obstructive jaundice with immense dilatation of the common duct; the gall-bladder also was drained, and the patient was in good health five months later. Mr. Fullerton mentions the following cases of this operation:—Mayo brothers, four cases all fatal in four days, one fatal in eight weeks, and one case of union of the hepatic duct and the duodenum which was

successful; Robson, three cases of anastomosis between the cystic duct and the bowel, with one death, one recurrence of jaundice, and one recovery; other cases are quoted from Sprengel, Kiedal, and Swain. Hartmann has also done the operation (*see* Mathieu, quoted below).

Benign Strictures of the Biliary Ducts.—Paul Mathieu,[8] in an extensive monograph on this subject, adopts the classification of *congenital* and *acquired* strictures. The former, of which he collects eight authentic and twelve doubtful instances, usually cause symptoms early in life, but the true condition may not be determined until operation is done for deepening jaundice, or it may be found unexpectedly at autopsy, death having occurred from some intercurrent malady. The stricture usually has been at or near the duodenal termination of the common duct. He thinks the question of icterus in the new-born is nearly related to this congenital deformity, and classifies infantile jaundice in two main divisions: (1) Those in which the condition is not compatible with life (congenital occlusion or total absence of the bile-duct); and (2) Cases compatible with life, including both (*a*) Cases of congenital icterus without lesion of the bile-ducts (which may be attributed either to angiocholitis or to splenic disease causing jaundice by hæmolysis), and (*b*) Those cases already mentioned, in which stricture, but not absolute occlusion, of the duct exists.

Acquired strictures of the bile-ducts are either inflammatory or traumatic in origin. The former are very unusual; Kehr and Mayo Robson have each observed three cases, while Körte encountered three among seventeen choledochotomies. The stricture results from angiocholitis, and this in turn is most frequently due to the irritation of a calculus; but cases may be recorded in the future of typhoid, tuberculous, or syphilitic strictures. Other causes of inflammatory obstruction are those from without the ducts, such as adhesions, duodenal ulcers, pancreatitis, etc., all of which are more apt to cause a diffuse than a localized stricture.

Traumatic are even more rare than inflammatory strictures, the few cases known being chiefly due to operative interference.

Operative relief of a biliary stricture is always indicated, and should not be delayed, as every day aggravates the patient's condition. Two indications are to be met: to re-establish the channel for the excretion of bile, and to drain, temporarily, the infected gall-bladder and hepatic ducts. The latter indication, Mathieu thinks, can in most cases be attained by the former means, namely by allowing drainage into the intestine, by direct treatment of the stricture, or even by cholecystoenterostomy; but should there be any evidence—even the slightest—of active angio-cholitis, the surgeon will have to establish independent drainage, either by **Cholecystostomy, Choledochostomy, Hepaticostomy,** or even a **Hepatostomy.** The latter operation, *hepatostomy,* is indicated, says Mathieu, only where all the extra-hepatic biliary ducts are strictured or occluded; the technique of Hirschberg (hepatotomy by a large trocar, and subsequent dilatation of this channel) is briefly described. The operations of hepaticostomy and choledochostomy

are less difficult in these cases of subjacent stricture than in others, because the ducts are always dilated by the backward pressure of the bile.

The technique of the operation for the re-establishment of the course of the bile comprises: (1) Treatment of the obstruction, including *resection*, or *incision* with plastic operation; and (2) Restoration of the continuity of the outlet, including end-to-end suture of the divided ends of the duct; or anastomosis of the upper segment of the duct with the intestine, and exclusion of the lower segment of the duct.

Resection of the Choledochus has seldom been done. The accompanying figures show the various methods which may be employed for supra-

Fig. 48.—Resection of choledochus.

duodenal obstruction. If reunion of the divided ends proves impossible by either method shown (*Figs.* 49, 51), both should be closed, and cholecystenterostomy done (*Fig.* 50).

Should the obstruction be near the ampulla of Vater, cholecystenterostomy will of course be preferred if the gall-bladder is reasonably healthy. Direct treatment of the stricture by trans duodenal incision of the duct was employed by Körte. Choledochoplasty of the supra-

duodenal choledochus, analogous to pyloroplasty, has been employed by Petersen and by Moynihan, the latter employing temporary drainage of the duct. In a case of excision of a portion of the wall of the choledochus, too extensive for suture, Kehr used the gastric wall instead of an omental graft to cover the opening.

There follows a brief description of the technique of various methods of anastomosing the biliary apparatus above the stricture with the intestine. **Hepatocholangio-enterostomy** (anastomosis of the intrahepatic bile-ducts with the intestine) was successfully practised in one case by Kehr. Garré, of Breslau,[11] has also reported a successful operation. **Hepaticogastrostomy** (anastomosis between hepaticus and stomach) has been employed by Quénu and by Tuffier, and **Hepatico-enterostomy** by Kehr, Mayo, and Terrier. **Choledocho-enterostomy** is a much less unusual operation, and **Cholecystenterostomy** is performed with relative frequency.

In regard to these operations (anastomosis between the bile-duct and the intestine) Mathieu asks the following questions: (1) With what portion of the digestive tube should the anastomosis be made? (2) Should it be by lateral anastomosis or by termino-lateral implantation? (3) What portion of the bile-duct should be used for the implantation? (4) What condition should the bile-duct present to render it possible to make the anastomosis? He prefers the duodenum for the site of the discharge of the bile; thinks termino-lateral implantation superior to lateral anastomosis; he asserts that other things being equal, the lowest available point of the bile-duct should be chosen for the anastomosis, but points out that as these operations are usually performed on patients from whom the gall-bladder has been removed, it will often be difficult to determine whether the hepaticus or the choledochus is being employed. Three conditions, he concludes, are necessary for the performance of the operation: (1) The duct must be of sufficient calibre; (2) The wall of the duct must be strong enough to retain the sutures; (3) The stump must be long enough to reach the intestine without tension.

The operation of hepaticoduodenostomy is then described and fully illustrated. It has been employed in five reported cases, once by Mayo, and twice each by Kehr and Terrier; Mayo's patient died in eight weeks from inanition due to a duodenal fistula, but the four others recovered.

This valuable contribution to the surgery of the bile-ducts closes with the narration of the brilliant and finally successful series of operations by which the lamented Terrier rescued his patient from death by the performance, under great difficulties, and as a last resort, of hepaticoduodenostomy. One of the last publications to emanate from the clinique of Terrier, to whom not France alone, but the entire surgical world, owes a debt of gratitude for his work as pioneer and high priest in the domain of biliary surgery, the present work is worthy of attentive study, and stands as an exemplar of the constant scientific activity with which the master inspired his pupils, and proves the

truth of one of the latest of Terrier's maxims, "that biliary surgery tends to become more and more *canaliculare*."

Typhoid Lesions of the Gall-bladder.—These have been studied in some detail during the past year by B. A. Thomas,[9] Astley P. C. Ashhurst,[10] and by E. Quénn.[11] Thomas reports four cases of post-typhoid cholecystitis, in two of which the *B. typhosus* was found in the gall-bladder. In 805 cases of typhoid fever he found only twelve (1·3 per cent) in which cholecystitis was noted; four of these twelve required operation, "and a fifth was allowed to go on to perforation, general peritonitis, and death." He collected from the literature 154 cases of typhoidal cholecystitis; gall-stones were present in thirty-one, or 20 per cent of the patients; about 90 per cent of the patients were females, and the *B. typhosus* was found in the gall-bladder in 50 per cent of all cases (typhoidal and post-typhoidal), and in perhaps 95 per cent of cases occurring during the course of the typhoid fever. He found the mortality following operation to be 54·6 per cent, but that all patients not operated upon died. It is not clear from his expression whether these statements are meant to apply to all cases of typhoidal

Fig. —Gall-bladder [illegible] perforation. (Natural size.—Ashhurst.)

cholecystitis, or only to those with perforation. Certainly many patients with cholecystitis arising during typhoid fever recover without perforation and without operation. This is shown from statistics quoted by Ashhurst, who found that among 2804 patients with typhoid fever treated at the Episcopal Hospital of Philadelphia (1905–1907) there were recorded eighteen cases complicated by cholecystitis (about 0·62 per cent of the whole number of cases), and that among the cases thus complicated by cholecystitis there were four deaths. "This, however, by no means implies that the deaths were due to the cholecystitis, since patients who at one stage presented symptoms of cholecystitis might recover from those symptoms and die at a later period from the toxæmia of typhoid or from asthenia; yet they would still be reported as cases complicated by cholecystitis. Only two of these cases were considered serious enough for the thought of operation to be entertained." In one the perforation was not found at operation, and the patient died of peritonitis; in the other the perforated gall-bladder was removed, and the patient recovered (*see Fig.* 52).

Cases of Typhoid Fever at the Episcopal Hospital, Philadelphia.

Year	Cases	Deaths	Mortality Per Cent	With gall-bladder complications Cases	Deaths
1905	981	85	8·66	8	1[1]
1906	1339	107	7·99	6	2[2]
1907 (to Oct. 1) ..	544	51	9·37	4	1[3]
Total ..	2684	243	8·48	18	4

[1] Recovered from cholecystitis before death. No operation.

[2] Neither patient was operated on. Autopsy only in the second case; this showed no peritonitis, and that death was due to pneumonia.

[3] Operation by Dr. G. G. Davis. Perforation of gall-bladder found post mortem.

Ashhurst collected twenty-one operations on the gall-bladder during typhoid fever, including his own, the nature and results of which are shown in the accompanying table:—

Operation	Cases	Recovered	Died	Mortality Per Cent
Aspiration of gall-bladder through unopened abdominal wall ..	1	1	0	—
Cholecystendysis	2	1	1	50·00
Cholecystotomy and drainage ..	9	4	5	55·55
Cholelithotomy	2	0	2	100·00
Cholecystectomy	3	2	1	33·33
Operation abandoned without finding lesion	4	0	4	100·00
Total	21	8	13	61·90

Two classes of cases may be recognized: "In the first there has been a more or less gradual onset of abdominal pain, fairly well localized (by patients who were conscious) to the right hypochondrium, accompanied by localized tenderness, and frequently by a palpable mass, easily recognized as the distended gall-bladder. If operation has been undertaken at this stage, there has been found: (1) Cholecystitis; (2) Empyema; or (3) Empyema and commencing suppurative pericholecystitis. In the second class of cases the symptoms already mentioned have existed for a period varying from a few hours to a week or ten days, when suddenly there has been an acute attack of abdominal pain, accompanied by a fall of temperature (noted in eight out of ten cases), and sometimes by sweating; these signs being gradually followed, when immediate operation was not undertaken, by a secondary rise of temperature, a spread of the pain and tenderness over the whole abdomen, and an increasing distention of the intestines."

Quénu points out that typhoid fever is not an intestinal disease (wherefore the term enteric fever is to be avoided), but a primary septicæmia; and the liver is the primary agent for the elimination of the *B. typhosus*, which is brought to it by the blood. In this manner the bile becomes infected, and thus are to be explained those cases in which the bacillus is found in the gall-bladder, but in which no history of previous typhoid fever can be obtained. He asserts that many

jaundices—hepatic, epidemic, or simple febrile in character—are nothing less than primary infections of the bile-passages by the *B. typhosus*, and he thinks Weil's disease is produced in the same way. Quénu collected forty-five operations for lesions of the gall-bladder during or soon after an attack of typhoid fever.

The questions of most interest when the gall-bladder is affected during the course of the typhoid fever are, whether, if such a thing be possible, an operation shall be undertaken before symptoms of peritonitis or perforation appear, and what shall be the special form of operation adopted, cholecystostomy or cholecystectomy? In regard to the first question, we cannot agree with Thomas, who advises early exploration in every case; for, as shown by the figures quoted above by Ashhurst, there are many patients in whom the cholecystitis subsides without operation, and we think it by no means proper to subject these patients to what must prove a serious operative risk during the height of the disease, unless the chance of their recovery without operation seems very slight indeed. It will be better, we think, to keep such patients under constant surgical supervision, and to open the abdomen as soon as the local and general symptoms point to the development of empyema or commencing pericholecystitis. When the operation is done before perforation has occurred, it can hardly be necessary to do more than drain the gall-bladder. Cholecystectomy, we believe, should be reserved for those cases with perforation or other destructive lesion of the gall-bladder (gangrene, chronic empyema); in such cases we think removal of the gall-bladder will decrease the mortality following the operation, because the convalescence will be less prolonged, and this is an important point in patients already weakened by a long course of typhoid fever.

Malignant Obstruction of the Common Bile-duct, due to a *melanotic sarcoma* involving the papilla of Vater, has been observed in one case reported by Francis J. Shepherd, of Montreal.[12] Cholecystostomy was done for obstructive jaundice, and the lesion was discovered only at autopsy.

Carcinoma of the biliary orifices is less rare than sarcoma. Schüller in 1901 collected forty-one cases. In either affection, carcinoma or sarcoma, radical operation is usually impossible. In our work on "The Surgery of the Upper Abdomen" (vol. i), there are noted ten palliative operations, one patient living two years, and one case in which Czerny did transduodenal excision of a carcinoma of the bile papilla, only to learn eight days later at autopsy that secondary growths already existed in the liver.

Wounds of the Gall-bladder. Couteaud[13] has collected thirty-nine cases of this kind, exclusive of subcutaneous ruptures of the gall-bladder. Operations were done in eleven of these cases, nine of the patients recovering. Stab and gunshot wounds comprise the majority of these injuries. The exact nature of the injury of course cannot be determined before operation, unless there is a discharge of bile from the wound, and even this sometimes is seen in injuries of the liver

alone; hæmorrhage from branches of the cystic artery, or from a wound of the liver itself, is a frequent accompaniment.

Following Terrier, Couteaud advises median laparotomy, and not exploration through the wound of entrance. To gain more room he suggests resection of the costal arch. Kehr's incision he thinks gives as free access as usually can be desired, and we have heard Terrier himself pronounce Mayo Robson's incision "not sufficient" for difficult cases of biliary surgery; and certainly in stab-wounds with hæmorrhage and extravasation of bile, very free exposure will be required. Cholecystectomy for wounds of the gall-bladder is branded by Couteaud as an "operation of necessity," suture of wounds being the "operation of choice." Cholecystorrhaphy was adopted by Kehr, Dalton, Dörfler, Bullinger, Tuzi, and Biagi, the patients recovering; and even in Walton's patient in whom suture was not done for forty-eight hours after injury, the sutures held firm though the patient died. If the cystic duct is completely cut across, cholecystectomy is preferable (Terrier and Auvray); if the division is only partial, drainage will suffice, as also in the case of small wounds of the hepaticus or choledochus. In more extensive wounds of the choledochus, suture should be attempted, or, this failing, cholecystenterostomy.

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GALL-STONES, MEDICAL TREATMENT OF. *Robt. Hutchison, M.D.*

Musser [1] considers that **Regulation of the Diet** is of the first importance. Patients with gall-stones usually eat too much, and it is advisable in most cases to cut down the intake of food to one half. The composition of the diet must be determined by the state of the digestion.

Hydrotherapy avails much—water internally and water externally. The latter includes proper general baths and proper local baths. The use of alternate hot and cold douches over the liver, of hot and cold compresses alternately, or the continuous application of hot compresses for half an hour or an hour twice daily, when there are congestions or inflammations (cholecystitis, cholangitis) are not only valuable for the relief of the symptoms, but are also great aids in the relief of the cholelithiasis. If there be any ptosis of the liver, or if the abdomen be pendulous, a properly fitted **Binder** should be applied. As regards drugs, no fixed rules can be adopted: their use must depend upon the patient's general condition. In other words, the treatment of cholelithiasis is that of the individual and not of a local condition. **Alkalies** are usually of value. Next to these comes **Muriate of Ammonia** if not contraindicated by the state of the stomach and intestines. The so-called biliary antiseptics come next in order—

Aspirin in 10-gr. doses two or three times a day, and the **Salicylates.** The use of **Phosphate of Soda** needs scarcely to be mentioned. It is best given in an effervescing form before breakfast. He has never seen any benefit from olive oil.

Plantier[2] approves of the method of Ferrand, who treats hepatic colic with **Glycerin.** This treatment has the following advantages: (1) Taken by the mouth it is directly absorbed by the lymphatic vessels going from the stomach to the liver; thus it finds its way to the subhepatic veins; (2) It is a powerful cholagogue; (3) In large doses (5 dr. to 1 oz.) it relieves attacks of hepatic colic; (4) In small daily doses (1½ dr. to ½ oz.), taken in alkaline water, it prevents a return of the attacks. It may be taken for months or years without injury, if pure and neutral; preferably in half a glassful of Vichy water.

Senator[3] recommends **Sodium Oleate** in doses of 2 gr. in pill after each meal. (This drug is also dispensed in 5-gr. capsules). Its activity is increased by giving large enemata of oil, and soap and water.

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GANGOSA. *J. W. W. Stephens, M.D.*

This disease is described by O. J. Mink and N. T. McLean in the *Medical Record* as existing in Guam, in the Ladrone or Marianne Islands (Pacific). The natives attribute the disease to food. The syphilitic view is excluded by the fact that syphilis does not exist among the natives. The initial symptoms resemble a tonsillitis, laryngitis, or pharyngitis of a mild degree. There is a slight rise of temperature, the pharynx is sore, and the muscles of deglutition are stiff. On the third day a patch of membrane appears somewhere in the fauces. In another twenty-four hours a typical ulcer appears, punched out, undermined; deep mutilations result, and permanent deformities. The membrane does not contain diphtheria bacilli.

GANGRENE, CUTANEOUS. *E. Graham Little, M.D., F.R.C.P.*

Rosenberger[1] made a bacteriological study of seven cases of noma—one following typhoid fever, and six following measles. From all these spreads were made during life and after death and showed a fairly constant "flora," of which the most abundant constituents were the spirillum and fusiform bacillus of Vincent: there were also found a diphtheria-like organism, streptococci, staphylococci, and occasionally pneumococci. These results are in accordance with previous records, which show a very diversified bacterial growth in gangrene. This author considers noma to be due to a symbiosis of a number of bacteria, and not the result of any one organism; probably the symbiotic organisms of Vincent play an important part.

Hellesen[2] made a careful examination of a case of gangrene of the cheek, terminating fatally, in a boy who had had measles two months previously. A diplococcus resembling the pneumococcus, but without capsule, was isolated, and found capable of producing gangrene in animals. Hellesen therefore concludes that in his case the diplococcus

was the active agent, but agrees with other observers in thinking that gangrene is not due to a single specific organism.

Levin[3] reports four cases of gangrene due to carbolic acid dressings, two in his own practice, and two in the practice of Prof. F. C. Wood. In one of these cases the condition had supervened after only six hours' application of a carbolic dressing for a slight injury. In all four cases the fingers were concerned, and hence Levin thinks the explanation must be sought in an ischæmia from capillary contraction, as in Raynaud's disease, and in spontaneous gangrene, beginning with a severe local anæmia. Carbolic acid therefore should not be used for permanent dressings; "It is never of much use, and is too frequently harmful."

Sheahan[4] reports a similar experience in which pure carbolic acid dressing was applied in mistake for carbolic oil to an injured finger; gangrene ensued within twenty-four hours and necessitated amputation.

REFERENCES.—[1]*N. Y. Med. Jour.* Feb. 1, 1908; [2]*Jahrb. f. Kinderh.* Mar. 8, 1908, in *Lancet*, Mar. 28, 1908; [3]*Med. Rec.* Jan. 25, 1908; [4]*Intercol. Med. Jour. of Austral.* Ap. 20, 1908.

GASTRIC CRISES.

(*Vol.* 1897, p. 379)—Cerium Oxalate, tried by Bechterew, reduced the severity and frequency of vomiting; pain, thirst, and nausea were also relieved.

GASTRIC, PYLORIC, AND DUODENAL ULCER.

Rutherford Morison, F.R.C.S.

The diagnosis of chronic gastric ulcer is chiefly based upon three symptoms: pain, vomiting, and the discharge of blood; and upon three signs: a tender spot, rigidity of the overlying muscles, and the presence of a tumour. Surgery has proved that the clinical diagnosis of ulcer is often wrong, and surgeons now recognize that inspection and palpation of the exposed stomach from the outside alone may be misleading, and that it is necessary to inspect or palpate (or both) the stomach from the inside as well, to ensure an accurate diagnosis. For the purpose of inspection the **Gastroscope** of Rovsing is a valuable aid to stomach surgery.

The great importance of a correct clinical diagnosis necessitates most careful consideration of the symptoms and signs, and in an overwhelming majority of cases this will lead to a true opinion. That pain, vomiting, and hæmatemesis, may all be present without an ulcer of the stomach is now well known, and in the case of women, mistakes of diagnosis based upon these grounds have been frequent.

Pain is the most important—may indeed be the one—symptom of a chronic gastric ulcer, but to take high rank in diagnosis it must have a quite definite history. Unless it occurs after food, and is absent when the stomach is empty, no serious diagnostic importance attaches to it. If it is present early in the morning before food has been taken, or is not relieved at once by vomiting the contents of the stomach, the possibilities are very strongly against ulcer. The time at which the pain appears has some value in localization, but not quite all that

has been attributed to it. Commencing soon after a meal, it suggests an ulcer towards the cardiac end of the stomach; an hour later, one at or near the pyloric orifice. The explanation of this is obviously food contact. Night pain, occurring in the early hours (one or two in the morning), has invariably in our experience been associated with an ulcer adherent to the pancreas. It is difficult to offer an explanation for this. Paroxysmal pain resembling that of biliary colic is associated with a pyloric ulcer, and is probably due to forcible irregular contractions of the unstriated muscle fibres of the pyloric end of the stomach.

Vomiting.—This may be a most misleading symptom and requires particular attention. First, it should bear a definite relation to the pain, and should, like this, follow the ingestion of food. Vomiting without severe pain, or occurring at other than fixed periods after food, is not a symptom of any value in the diagnosis of chronic gastric ulcer. The vomited matter is most likely to be nothing but food taken, and after the stomach has been emptied by the act of vomiting the patient should feel entire relief. The sickness is comparatively easily controlled by limiting the amount and quantity of food taken, and by rest. Vomiting which is not controlled by rest in bed and by fluid diet is quite unlikely to be due to ulcer. Uncontrollable vomiting is not due to chronic gastric ulcer.

Blood.—The presence of relatively small quantities, repeated at intervals, of blood in the vomited matter is an important symptom of gastric ulcer. Other forms of blood-loss do not possess the same significance. Blood, especially when only discoverable microscopically in the stomach contents or in the stools, suggests a cancerous rather than a chronic ulcer. Profuse, painless, sudden hæmatemesis in a young woman is quite unlikely to be due to a chronic ulcer, and in an elderly patient suggests cirrhosis of the liver.

A tender spot in the epigastrium has significance, and taken along with other symptoms and signs is a valuable aid to diagnosis.

Rigidity of the overlying muscles is frequently found in chronic gastric ulcer. It is unlikely that an active pyloric ulcer exists if the upper portion of the right rectus does not show rigidity.

The Presence of a Tumour.—A considerable tumour may be caused by inflammatory induration round a chronic ulcer, but this is very rare. A definite tumour suggests a cancerous, not a chronic, ulcer. A tender nodule or an indefinite induration, especially in the neighbourhood of the pylorus, with a history of long-standing stomach trouble, are characteristic of chronic ulcer, and a most important sign. The usual history given by a patient with chronic gastric ulcer is one of long-standing "indigestion." There has been pain after taking food, depending to a large extent upon the quality and quantity of it, occasional vomiting when the pain was severe, and relief after the stomach was emptied by sickness. Often the first warning to the patient of anything more serious than he had thought, was the appearance of some blood in the vomited matter. With or without

a variety of treatment there have been periods of health so good as to give hopes of a "cure," but a disappointing relapse is apt to make its appearance and dissipate these, the truth being that healing of a chronic gastric ulcer is only brought about with great difficulty, and much less often than has been supposed. Experience has taught us that the apparent "cure" is not usually due to healing of the ulcer, but, for some at present unknown reason, to its loss of sensibility. During the painless intervals small dietetic restrictions suffice to keep the patient comfortable, but after a time these restrictions have to be more rigidly practised, and the intervals of ease are apt to become shorter, until eventually a condition of chronic invalidism results.

The TREATMENT of chronic gastric ulcer is by an operation and after treatment. Excision of the ulcer is the ideal operation according to many distinguished operators. This ignores, however, the possibility of an ulcerous diathesis and the permanent preventive effect of gastro-enterostomy on fresh ulceration; but in addition, excision is seldom applicable, and experience has proved that gastro-enterostomy is the best operation for universal adoption for the present. Its mortality is less than 5 per cent. Of those who recover, during the first year after operation, in 50 per cent all the symptoms disappear and the patients are able to eat, digest, and enjoy ordinary food. In 30 per cent considerable relief follows the operation, in 10 per cent there is some improvement, and in 10 per cent no improvement. These results can, however, only be achieved by careful medical attention after the operation is completed, and patients should be taught that a chronic ulcer of the stomach, just as much as tubercle, means care afterwards in diet, and attention to the general laws of health.

Pyloric Ulcer.—The fact that healing of a pyloric ulcer is followed by more or less stricture of the pylorus separates it clinically from other forms of gastric ulcer. It resembles most closely those forms of duodenal ulcer which are followed by stricture of the duodenum, for these produce the same pathological results and symptoms. In addition to the ordinary history of gastric ulcer, viz., pain, vomiting, and hæmatemesis, with periods of remission, each remission is followed by less complete recovery until the evidences of stomach dilatation take the foremost place. Severe pain is then seldom complained of, and the character of the vomited matter becomes of greatest importance. When dilatation has fully developed, the vomited matter is frothy and smells yeasty; it is in greater quantity than the amount of food taken; it contains particles of undigested food partaken of hours before, and occurs towards evening from the filling of the stomach during the day. Continued splashing of the stomach on succussion confirms this; the increased stomach area visible when the stomach is distended with gas, and a tender nodule moveable during the act of respiration and in the neighbourhood of the pylorus make the diagnosis of stricture due to pyloric ulcer certain.

The usual history is that the patient's illness is of some years' duration, that it commenced with "indigestion" and hæmatemesis,

which after a short period of treatment disappeared, though digestion had never been quite so perfect as before. After an interval of good health the symptoms recurred, and similar attacks followed from time to time. Finally, no amount of care sufficed to bring about a return to health, vomiting of a large quantity of yeasty matter occurred every evening or every few days, and the only real comfort the patient felt was after the stomach had been emptied by this act.

TREATMENT.—All surgeons are agreed that this is the type of case most surely benefited by the operation of gastro-enterostomy. The results are so satisfactory that, when a diagnosis has been made, operation should be strongly advised. A very few patients are so much improved by washing the stomach out that operation can be delayed, but it is rare to see permanent improvement follow. If the effects of stomach lavage are not immediate, no good results from its continuation. The results of operation in competent hands are that 90 per cent are cured, 7 per cent improved, and 3 per cent die.

Stricture of the Pylorus.—In the great majority of instances stricture of the pylorus results from cicatrization of an ulcer. The cause of other forms of stricture has not yet been settled. The consequences of stricture of the pylorus are the same as those of stricture of the outlet of other hollow viscera. For a time hypertrophy of the stomach walls compensates more or less perfectly for the obstruction, the stomach cavity is diminished, its walls are thickened, and symptoms of serious stomach disorder are absent. Later, inflammation of the mucous membrane of the stomach follows, and in some cases increased contraction of the unstriated muscle of the stomach wall, especially near the pylorus, gives rise to attacks of colic, as it may do in like circumstances in the case of all the hollow viscera, and in consequence difficulties in diagnosis arise. It is occasionally impossible in these cases, as it is in ulcers close to the pylorus in either stomach or duodenum, which lead to similar attacks, to say whether the painful contractions are at the pylorus or at the gall-bladder (gall-stones), and many operators have discovered that gall stones may produce stomach symptoms, and stomach disease the troubles of a gall-stone. At a still later stage dilatation of the stomach occurs with all the attendant symptoms, though it is rare to have a stricture so tight as to produce this which is not cicatricial and due to old ulceration. Apart from the cicatricial variety we recognize at the present time two types of stricture. The first converts the pylorus into a membranous, elastic, easily dilatable opening. In this form operation has not in our experience been followed by satisfactory results. The second form converts the pylorus into a uniformly thickened resisting ring; in this variety operation (pyloroplasty) has in our experience been followed by complete recovery.

Congenital Stricture of the Pylorus in Children.—The fact has been established that stricture of the pylorus occurs in infancy much more frequently than was, after its early recognition, supposed. The first symptom noted, usually in healthy boy babies about ten days old,

is that of attacks of forcible vomiting after meals. The food may be ejected with such force as to reach a considerable distance, and is often more than the child has taken. After a time emaciation becomes extreme, but in spite of the wrinkled, emaciated appearance of the child, he may seem to be brisk and fairly vigorous. The vomiting is not, as is the rule in other gastric conditions of babies, attended by diarrhœa, but by constipation. The diagnosis is completed by examination of the epigastric area: if after a meal rhythmical peristaltic waves can be seen passing over the stomach from left to right, and if a nodule in the position of the pylorus can be palpated.

Surgery has not maintained the position it held earlier in these cases. The results of operative treatment have not equalled those obtainable by medical measures, the chief of which are daily washing out and careful feeding.

Surgeons are fortunately realizing that patients with stomach troubles, in which nervous symptoms predominate, are not proper cases for operation. Atonic dilatation, gastroptosis, adhesions, pyloric and duodenal kinkings, and other similar fanciful diagnoses, no longer justify surgical interference.

J. M. T. Finney[1] says that organic pyloric stenosis is a surgical problem, as for permanent relief only surgical measures are to be relied upon. In the vast majority of cases it has its origin in an active or healed ulcer, and the connection of chronic ulcer and cancer should not be forgotten. In choosing an operation many considerations should influence the operator: the pathological conditions found, the skill of the surgeon, and the general state of the patient.

Pylorectomy is the operation of choice in early cancer. Gastro-enterostomy should be reserved only for cases in which this is impossible. The last report of the Mayo Clinic for pylorectomy shows a death-rate of only 9·5 per cent. After excision of the growth the divided ends of the stomach and duodenum are closed and a posterior gastro-enterostomy is performed. The operation can be completed in from one to one and a half hours. In cases of doubt as to the pathological diagnosis, especially in persons past middle life—and this may exist if there is marked induration even after the specimen has been removed—pylorectomy is the operation of choice.

For benign obstruction there is a greater choice—gastro-enterostomy, pylorectomy, pyloroplasty, gastroduodenostomy, etc. Though many arguments have been found against gastro-enterostomy, with the majority of surgeons it is the operation of choice, and in the greater number of cases of simple pyloric obstruction it is followed by satisfactory results. Nevertheless, though the mortality results are very satisfactory in the hands of skilled surgeons, the occasional operator is more likely to succeed with the less complicated technique of pyloroplasty or gastroduodenostomy. The question of drainage through the new stoma in gastro-enterostomy, the advantages of which were offered by its supporters as the chief inducement to its performance, must for the present remain in doubt in face of recent

experimental evidence. Peptic ulcer is one of the occasional sequences of gastro-enterostomy, though probably less likely after modern methods of doing it. Vicious circle difficulties are now rarely met with, but when they do occur are of the greatest gravity. "The advantages of pyloroplasty are obvious, preserving, as it does, the natural anatomical and physiological outlet." Forty-five operations have been performed by Finney by his own method and in all classes of benign pyloric stenosis. The results have been most satisfactory in all, including dilatation of the stomach, dense adhesions, hypertrophy and cicatricial thickening of the stomach wall, acute and chronic ulceration, hæmorrhage, pylorospasm, etc. He has found no case in which the operation was contraindicated or could not be performed. The mortality is about the same as perhaps a little better than that of gastro-enterostomy.

W. J. Mayo[2] says the average duration of the pre operative symptoms in his cases was over twelve years, and no patient was operated upon until medical treatment had failed. The earlier failures of gastro-enterostomy were due to faulty technique and to it being looked upon as a "cure-all" operation. During a period of fifteen years, up to May, 1908, C. H. Mayo and himself operated upon 768 patients; 225 of these were for benign lesions other than ulcer, and are classified into the following groups: (1) Adhesions and bands, the result of ulcer; (2) Secondary infectious processes such as subdiaphragmatic abscess, etc., the result of perforating ulcer; (3) Cases apparently of inflammatory origin, but in which evidence that the process was ulcer proved insufficient to classify them as such; (4) Pyloric obstruction from contracture of the pyloric muscle, valve formation, etc., apparently not due to ulcer; (5) Bullet and stab wounds, other traumatisms and foreign bodies; (6) Benign tumours, hypertrophic pyloric stenosis, syphilis and tuberculosis; (7) In which the stomach was opened to obtain access to the cardiac orifice for cardiospasm and benign strictures of the œsophagus, gastrostomy, etc.; (8) In which the duodenum was opened to obtain access to stones and tumours in the posterior wall of duodenum, papilla and ampulla of Vater; (9) Obstructions and ulcerations of the stomach and duodenum caused by gall-stones; (10) Negative explorations of interior of stomach and duodenum. The remaining 540 cases were operated upon for ulcer of the duodenum and stomach.

Acute Perforations.—Of twenty-seven cases operated upon, primary gastro-enterostomy was performed in five, there being two deaths. In twenty-two closure of the perforation was made with abdominal drainage, and only one of the eighteen who recovered required a secondary gastro-enterostomy, the perforation having seemingly put an end to the disease. Acting on this observation, he twice, in chronic gastric ulcer where the conditions were such that he could not excise and where gastro-enterostomy was not indicated, exposed the crater of the ulcer, which in each case was found comparatively small but surrounded by a mass of indurated scar tissue. With a sharp knife

he cut out the base of the ulcer, thus producing the picture of acute perforation, and then closed the defect. He cannot speak for the ultimate result, but the immediate results were most favourable.

Development of the Surgical Treatment of Chronic Ulcer.—He divides his experience in the surgical treatment of chronic gastric and duodenal ulcers into three stages: (1) the period previous to 1900, (2) the period from 1900 up to and including 1905, (3) from 1905 to the present time.

1. When gastro-enterostomy and pyloroplasty were performed with a mortality of 6 per cent. The former operation was made anteriorly with a Murphy button; some complications which ensued were dropping of the button into the stomach, contraction of the opening due to the traction weight of the attached intestine at the point of anastomosis, volvulus of the loop, and incarceration of the small intestine through the loop. One-third of the cases subjected to pyloroplasty required secondary operation. They learnt that the greater the obstruction the more certain the cure, and the value of having the stomach opening at the lowest point.

2. During the second period their previous successes encouraged them to operate on cases earlier, and not to wait until there was actual starvation through obstruction. The results of this group did not however compare favourably with the earlier period, in which the problem was purely one of mechanics arising from interference with gastric drainage, or with the third period, in which technical errors had been largely eliminated and a sound pathological basis substituted for fallacious clinical observations. They quickly found that food did not pass through the gastro-enterostomy opening unless mechanical obstruction was present. Ulcers to the left of the pyloric end of the stomach should be excised, with an additional gastro-enterostomy if necessary. In 180 cases where the stomach was resected, cancer on the ulcer base was demonstrated in 54 per cent; this fact has stimulated them to excise gastric ulcers where possible. During this period improvements in the technique of gastro-enterostomy were made, and the posterior operation gradually replaced the anterior method. The loop was eliminated, and the jejunum was no longer turned to the right. With 300 cases by this method there was a mortality of less than 1 per cent, and only three cases required a secondary operation upon the stomach for any cause. The cause of any failure to cure was due to deficient pathological knowledge, it often not being proved on the operating-table that a pathological lesion was present. In fourteen of these cases, where the primary operation was done by themselves or other surgeons, they closed the gastro-enterostomy opening by a secondary operation, and restored the gastro-intestinal canal to its normal continuity. Finney's operation gave good results from pyloric obstruction, but not so good where there was an ulcer.

3. During this period of two and a half years they have been able to recognize an ulcer on the operating-table: if it was not

demonstrated, no gastric operation was undertaken unless necessitated by hæmorrhage. Gastro-enterostomy is done for duodenal ulcer, Finney's operation for pyloric strictures, and gastric ulcers at a distance from the pylorus are excised. If hour-glass contraction is present, the whole diseased area is excised; should it not be possible to do this, proximal gastro-enterostomy is performed. Calloused ulcer of the pyloric end of the stomach indicates Rodman's operation (excision). The mortality of even the more complicated operation does not exceed 3 per cent, while he thinks the cures will exceed 95 per cent.

In the 318 cases of actually demonstrated ulcer, 234 were traced. Of these 80·7 per cent were cured; 9 per cent improved; 4·2 per cent unimproved, and 6 per cent have died from various causes since the operation; in only two cases, however, was the cause of death connected with the stomach, showing a total of 80·7 per cent cured and improved. He urges the careful regulation of diet following operation under medical supervision, until they have made a complete recovery.

M. K. G. Lennander[3] states that in perforated cases there is no need to suture the ulcer and combat with peritonitis, but to establish a **Gastrojejunostomy.** He sutures the ulcer roughly, makes a gastrostomy (Witzel), and also a similar fistula in the cæcum. The stomach fistula is left open, and the patient given bicarbonate drinks only, by the mouth. Through the cæcal fistula is given a 10 per cent solution of glucose. At the seventh day the gastric tube is closed from time to time. The cæcal fistula, in addition to glucose, has injected into it milk and flour foods on the tenth day: the fistula is closed on the thirty-fourth day by taking out the tube, and heals at once. The gastric tube is withdrawn in the sixth or seventh week after operation. When the patient is quite better a gastrojejunostomy is done. He claims four advantages for this method: (1) Resting the ulcer; (2) Washing out the stomach; (3) The cæcal fistula prevents attacks which can provoke intestinal paralysis resulting from a very extensive peritonitis; (4) Keeping up the patient's strength by utilizing the colic digestion. Lennander has had four cases besides this one.

Ulcer and Carcinoma.—Rodman[1] quotes numerous authorities, giving their statistics, to support his statement that over 50 per cent of gastric carcinomata are due to neglected ulcers. Youth does not exclude malignancy, for he has met the condition in a person aged 16. It is impossible to diagnose a gastric ulcer undergoing early carcinomatous change until the abdomen is opened, and even then mistakes are often made. He quotes Oettinger, who says that persistent pain which is unrelieved by treatment is suspicious of malignancy: it is typical neither of ulcer nor of cancer, is violent, constantly radiating to the ribs and thence to the lumbar region, particularly to the last dorsal or first lumbar vertebræ; moreover, the patient vomits frequently, though in small quantities, and there is anorexia.

Rodman considers that important factors in diagnosis are persistent

loss of weight, steady decrease in the amount of hydrochloric acid, with perhaps only very slight gastric symptoms. Achlorhydria is more often met with in cancer than is hyperchlorhydria. The method by which gastric ulcers heal is important:—(1) A shallow ulcer heals owing to the fibrous cellular thickening of the submucosa drawing the edges of the mucous membrane together; this he considers a healed ulcer. (2) Should the ulcer extend to the muscular layer, however, healing of connective tissue proliferation is slow on account of the small amount of cellular tissue surrounding the bundles of muscular fibres; if it does heal, the mucous membrane adheres to the muscle, the intermediary layer being destroyed; the glands in the periphery of the ulcer show various alterations in form. (3) If the ulcer is adherent to surrounding structures, contraction of scar tissue is not sufficient to completely close the ulcer; they therefore do not heal, but become deeper and deeper, death usually occurring from hæmorrhage. His treatment for all doubtful cases is a laparotomy. If the ulcer is at all suspicious it is freely excised.

Chronic Duodenal Ulcer.—Until recently the differential diagnosis of duodenal and gastric ulcer was uncertain, but now, chiefly owing to the work of Moynihan, a definite diagnosis is possible in the majority of cases. Pain is the chief characteristic feature of duodenal ulcer. Like the pain of gastric ulcer, it has a relation to the ingestion of food, but in every other respect is distinguishable by definite symptoms. It is frequently relieved by food, and the more indigestible the meal the longer the period of relief following it. Pain which occurs less than one hour after a meal is unlikely to be due to duodenal ulcer. The explanation offered of this is that the introduction of a meal is followed by closure of the pylorus and protection of the ulcer, and that until digestion of the stomach contents has occurred the pylorus continues to be firmly closed.

Vomiting is rare in duodenal—much less frequent than in gastric—ulcer. It seldom appears spontaneously, but not infrequently patients have discovered that by inducing vomiting they obtain relief, and they therefore encourage it.

If blood vomiting occurs it is sudden and profuse, and is usually accompanied by serious symptoms of collapse. A frequent story is that the patient felt faint, broke out into a cold sweat, and had a loose evacuation from the bowels of changed blood soon after. The diagnosis is complete if on physical examination a definite tender spot is found under the upper part of the right rectus abdominis muscle, or if there is rigidity of this portion of muscle, or if both signs are present.

The usual history of such cases is one of years of "indigestion," passing off entirely or almost so from time to time; that pain was the chief symptom and occurred from one and a half to two hours after a meal, and was temporarily relieved by more food; that the chief pain might have been felt at night and was relieved by flexion of the body, either lying curled up on one side or on the back with the legs

drawn up, or sitting up and leaning forward, or that the pain might have come on in attacks like those of biliary colic; that vomiting was rare, and if it occurred, unlike that in gastric ulcer, it relieved the pain for a short time only; that perhaps fainting attacks, followed by a liquid, black, offensive stool, had been observed at distant intervals.

TREATMENT. Some of the best authorities say that a duodenal ulcer never heals. This is not true, for we have more than once during routine post-mortem examinations found the scars of healed ulcers in the duodenum. It is true to say, however, that a duodenal ulcer is a very serious possession, because those on the convex surface of the duodenum are likely sooner or later to perforate, and those on the opposite side are equally certain to bleed, and operation is the only treatment likely to bring about healing. It is an interesting fact that duodenal ulcers are practically limited to the first part of the duodenum, i.e., the portion in which gastric juice, undiluted by the alkaline bile and pancreatic juices, is found, and emphasises strongly the view, which we share, that the good effects of gastro-enterostomy in gastric and duodenal ulcers are largely due to this admixture. If the experiments of Canon and Blake, proving that in dogs after gastro-enterostomy food still passed out of the stomach by the pylorus, were true of human beings, the operation of gastro-enterostomy would be of little use in duodenal ulcer cases, but Röntgen rays and bismuth meals have proved that what is true of dogs is not true for man, and surgery has proved that duodenal ulcers are cured by gastro-enterostomy, and that the cure is as a rule rapid and lasting.

G. A. Moynihan[7] says a duodenal ulcer is almost invariably small, round, and hard, situated within half an inch of the pylorus, and nearly always on the anterior surface of the duodenum, exactly where the first squirt through the pylorus would impinge on the duodenal mucosa; and he thinks this slight traumatism is a factor of some significance. In the diagnosis of gall stones from duodenal ulcer, the mathematical relationship between the onset of pain and the taking of meals in duodenal ulcer distinguishes it from gall-stones. Another point in diagnosis on which he lays great stress is a spasm of the diaphragm with a catch in the breath, which is nearly always present in gall-stones. To determine the presence of a slight degree of jaundice he examines the blood in a capillary tube for bile. The point which makes the differential diagnosis between appendicitis and duodenal ulcer difficult, is a spasm of the pylorus. This spasm he attributes to an effort of nature to temporarily prevent the onward passage of food in order that the intestine in the neighbourhood of the already inflamed appendix be spared from further irritation. Therefore, if there is a doubt in the diagnosis, give the patient a meal of milk mixed with bismuth and watch with the X-ray screen: if the meal does *not* pass onwards into the duodenum the condition is probably appendicitis.

Perforation of a duodenal ulcer is treated by closing the ulcer and

performing a gastro-enterostomy at the same time. He comments on the danger of hæmorrhage from a duodenal ulcer, it being far more serious than bleeding from a gastric ulcer. At the operation for its relief he always infolds the duodenal ulcer, if he cannot extirpate it.

Garrow[6] states that duodenal ulcer is as common as gastric ulcer, and many secondary anæmias of unexplained origin owe their existence to a latent duodenal ulcer with unrecognized melæna. Though medical treatment will sometimes cure a chronic duodenal ulcer, it cannot prevent the subsequent narrowing of the canal. Surgical treatment gives a larger percentage of permanent cures, and moreover prevents hæmorrhage, perforation, and obstructive symptoms. He classifies his cases under three headings: (1) Typical cases; (2) Those with an atypical history strongly suggestive of gall-stones or cholecystitis; (3) Cases which are latent until perforation, hæmatemesis, or melæna occur, or where symptoms of motor disturbance manifest themselves. Perforation may be the first and only symptom, and is more fatal than a gastric perforation. In each of his cases a well-marked leucocytosis was present. Perforation on the upper or posterior wall, protected by adhesions, may give rise to a subdiaphragmatic abscess.

Deaver[7] says the end results following operation for gastric ulcer are good in the vast majority of cases. In gastric dilatation, gastric myasthenia, and ptosis of the stomach, probably the most that surgery can do is to so alter the mechanism of the stomach and intestine that medical measures will become effective. In pyloric obstruction a definite procedure is indicated, namely, the establishment of a free and permanent communication between the stomach and intestine. In all the above diseases the best results are obtained by the no-loop-clamp method of posterior gastro-enterostomy, a portion of the mucous membrane being excised. The no-loop operation obviates the danger of a vicious circle being established. Should this complication ensue, an entero-enterostomy must be performed. Of sixty-six of his cases which he has been able to trace where benign disease had been present, 80·3 per cent are greatly relieved, 66·6 per cent being cured. Eight of the number have died. He concludes: (1) The operation of choice should always be performed when feasible; when not feasible, the operation of necessity. (2) All cases of stenosis of the pylorus, whether due to a neoplasm, cicatricial contraction, hyperplasia, pylorospasm, or what not, should be treated by operative interference, preferably by posterior gastrojejunostomy; (3) All cases of ulcer of the stomach which do not respond to medical treatment promptly, and the various sequelæ of this disease, should be treated by operation; (4) All cases of ulcer of the duodenum which do not respond promptly to medical treatment should be treated by operation; (5) My preference in performing gastro-enterostomy is by the posterior gastrojejunostomy no-loop-clamp route.

References.—[1]*Amer. Jour. Med. Sci.* Mar. 1908; [2]*Ann. Surg.* June, 1908; [3]*Sem. Méd.* Oct. 9, 1907; [4]*Surg. Gyn. and Obst.* June, 1908; [5]*Med. Press*, July 29, 1908; [6]*Montr. Med. Jour.* June, 1908; [7]*Ann. Surg.* June, 1908.

GASTRO-ENTEROSTOMY.- (*See* STOMACH, SURGERY OF.)

GASTROSCOPY. *Chevalier Jackson, M.D.* / *John W. Boyce, M.D.* } *Pittsburg.*

The superiority of inspection to deduction as a process in diagnosis requires no argument. It may be measured by the usefulness of the cystoscope. Yet, curiously enough, it was the success of the Nitze-Leiter cystoscope that retarded gastroscopy. The earnest and ingenious efforts of von Mikulicz, Rosenheim, and Rewidzof in this field were ever fruitless, because they started with the radical and radically wrong principle of obtaining a view through a lateral window by an arrangement of lenses and prisms.

There are several differences in anatomical conditions, not necessary to enumerate, that render the cystoscopic principle unsatisfactory for gastroscopy.

In the first place, the presence of an optical apparatus implies a blind extremity. The heavy metallic instrument must be passed in the dark by sense of touch alone. It may rupture an aneurysm or a varicose vein. It may pass through an ulcer or the thin bottom of an œsophageal diverticulum. It can only with great difficulty be made to find the œsophageal opening of the diaphragm. Secondly, the presence of the optical system prevents sponging the field of view, which is

Fig. 53. The Chevalier Jackson Gastroscope.

absolutely essential to a clear picture. There is no such thing as an empty stomach. Even the normal organ, after fasting and lavage, contains in its folds sufficient fluid to obscure the view. Even with the drainage canal and suction pump of the Jackson instrument, it is necessary to keep a sponge-holder constantly going, wiping off the area under inspection.

For a number of years Chevalier Jackson has been examining the stomach with an instrument (*Fig.* 53) which is a normal development from the œsophagoscope. Frequently, deep-seated strictures prove to be spasmodic, and under general anæsthesia there is not the slightest difficulty in finding the way inside the stomach as far as the length of the tube permits. With the distal illumination, length of tube sufficient to reach the bottom of the greater curvature (70 to 80 cm.) imposes no additional difficulties on the operator. The constant presence of secretion necessitated the addition of a drainage canal running in the wall of the instrument and connected by rubber tubing to an efficient form of aspirator. This gastroscope then consists of a metal tube 12 mm. in diameter and 70 to 80 cm. in length. In the wall are two canals, one to accommodate the light-carrier, bearing a small electric

lamp at its end, the other, as described, for drainage. An obturator is provided to aid in passing the cricoid cartilage. Gastroscopy demands general anæsthesia to relax the diaphragm, but the technique is otherwise exactly that of œsophagoscopy. When the tube enters the stomach, a small area of mucous membrane is seen, which is sponged clean and the tube then advanced to another area, and so on, until the greater curvature is reached. By a slight lateral motion of the head, the tip of the tube is swept in the opposite direction along the greater curvature, and then gradually withdrawn to the cardia. In this manner two-thirds to three-fourths of the gastric mucous membrane may be searched, just as we search the surface of a slide with a microscope.

The position and shape of the stomach in the living subject has been most curiously misunderstood. *Fig.* 55 is traced from one of the classical text-books on anatomy. Chevalier Jackson states that whatever may be the position and shape of the stomach in the cadaver or

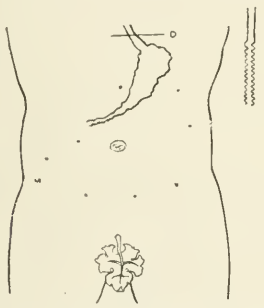

Fig. 54.—Schema of position of the stomach in the case of Isabel A. Crosses show where the wall of the stomach was intentionally pushed by the gastroscope. The schema in the upper right-hand corner shows the other plane of the stomach.

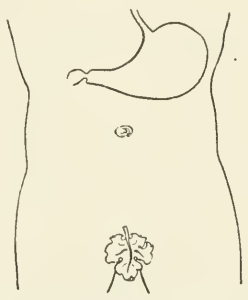

Fig. 55.—Position of the stomach as shown in a classical text-book on anatomy.

in the living subject after the abdomen is opened, it was certainly not in any such position in any of the seventy cases examined gastroscopically by him. His method of outlining the stomach is to find a given boundary with the extremity of the tube. The distal end of the tube is felt by the abdominal palpator, who makes a mark on the patient's skin with a skin pencil. Another position on the boundary is then found and marked, and thus a series of marks dot the skin of the abdomen corresponding to the stomach outlines. An obvious source of error is the drag of the tube, which may displace the stomach. This can be avoided by a careful watch through the tube, and care to make a vertical insertion for each mark.

The stomach wall can be pushed into almost any position, as shown in *Fig.* 54. The position of the stomach in the case of Isabel A. is shown here. It gave the impression of a loose bag dangling on the

end of the gastroscope, freely movable in all directions, by either the movement of the gastroscope or the manipulations of Dr. Harold A. Miller, who was palpating the abdomen externally. The diagram at the upper right hand corner of the illustration shows schematically the other plane as it appeared to be when gastroscopically examined. Passing down the œsophagus, as soon as one passes the cardia, folds and wrinkles are encountered, a slight deflection bringing either the anterior or the posterior wall into view.

The degree of motion shown in *Fig.* 54 is obtainable only under the relaxation of deep anæsthesia. When gastroscopy is attempted under morphine narcosis, as Mikulicz did it, the musculature of the diaphragm pulls upon the central tendon, so that the gastroscope is guyed rigidly like a tent pole, and if the stomach can be entered at all, only such portion can be inspected as lies in a line with the axis of the entry of the tube. When relaxed under deep anæsthesia the hiatus œsophageus does not relax or enlarge so as to permit of motion, but the entire dome of the diaphragm can be moved sidewise because it is a dome. If it were a tightly stretched membrane, there would be no yield in any direction; but being arched, its "slack," as one might say, permits of a range of motion of from 10 to 15 cm., provided the central tendon is not pulled upon from all sides by the diaphragmatic musculature. The collapsed stomach is relatively small, and much of it is near the middle line (*Fig.* 54). When one distends the stomach he pushes most of the otherwise explorable area away from the central line, and thus laterally out of range. The diaphragm is rendered much less movable when the stomach is distended, and, furthermore, the practice of a most valuable part of the technique, namely, the manipulation of the abdomen externally by an assistant, which brings into view the fundal and pyloric ends, is thus rendered impossible. A lens system and an inflated stomach prevent the sponging away of secretions with which many lesions are covered.

In regard to the safety of gastroscopy, Dr. Jackson states that in no instance did harm follow. Occasionally, stiffness or soreness in the neck was noted for one or two days. There was no other unpleasant symptom in the whole series of seventy cases, and no patient died, from any cause whatsoever, within thirty days after the gastroscopy. The utility of gastroscopy in the removal of foreign bodies is obvious. Its highest function, however, is as an instrument of diagnosis in the hands of the gastrologist, and of the gastroscopic assistant of the abdominal surgeon, who will assist the surgeon, not only in diagnosis, but in the operating-room during the operation, by working through the mouth in conjunction with the surgeon, whose hand is in the abdomen.

The twenty-four coloured figures (*Plates XIX to XXI*) accompanying this paper well illustrate the appearance of the conditions described as shown by the gastroscope.

Chevalier Jackson reports the following positive findings in 18 patients out of the 70 examined, some patients having more than one

GASTROSCOPY.

Description of the Appearances overleaf (*Plates XIX, XX, XXI*), Revealed by Gastroscopic Examination.

1. Thoracic œsophagus. Expiration. Man aged 40 years.
2. Œsophagus at hiatus diaphragmatis. Normal. Note axis of lumen. Man aged 60 years.
3. Normal stomach. Note horseshoe-shaped position of a fold usually seen near the cardia, occasionally elsewhere.
4. Normal stomach. This and the preceding view show folds in various positions as seen separating and collapsing ahead of the tube-mouth as it is inserted and withdrawn.
5. Ibid.
6. Normal stomach after aspirating (through drainage canal of gastroscope) recently ingested breast milk. Infant of 12 months.
7. Normal wall of inferior curvature flattened by pressure of the tube-mouth. Firmer pressure obliterates the striped appearance and often shows a mottled appearance.
8. Chronic gastritis, localized. Man of 32 years. Other cases of gastritis have shown a smooth deep red, still others a smooth pale appearance, sometimes with minute vessels visible.
9. Chronic gastritis. Woman aged 21 years.
10. Ibid.
11. Approaching the pylorus. Gastroptotic stomach. Mucosa probably normal. Woman aged 33 years.
12. Ibid. Pylorus hidden by folds. Same patient.
13. Pylorus. Same patient.
14. Ibid. About one minute later. Annular folds of pylorus surrounding prolapsed duodenal folds. Brownish fluid was regurgitated from duodenum into stomach, probably by an antiperistaltic movement excited by the contact of the tube-mouth.
15. Cardiospasm. Abdominal œsophagismus. Man aged 59 years.
16. Carcinoma of pylorus, covered by normal but foldless mucosa. Man aged 46 years. Afterwards operated upon by Dr. James McClelland, and diagnosis as to size, shape, position, and nature verified.
17. Ibid. View at left edge of growth.
18. Cicatrix (?) of stomach in a man 59 years of age with a history of syphilis.
19. Ulcer. Bed unilluminated. Folds printed too dark.
20. Cicatrized perforated ulcer. Man aged 62 years.
21. Carcinoma of lesser curvature. Afterwards surgically explored by Dr. John L. Buchanan, and diagnosis verified.
22. Gastroscopic view of a gastrojejunostomy opening drawn patulous by the tube-mouth. Woman aged 21 years.
23. Carcinoma of pylorus. Nodule on lesser curvature near pyloric antrum. Man aged 46 years.
24. Ibid. Showing localized zone of hyperæmia.

PLATE XIX.

GASTROSCOPIC EXAMINATION.

DR. CHEVALIER JACKSON, PITTSBURG U.S.A.

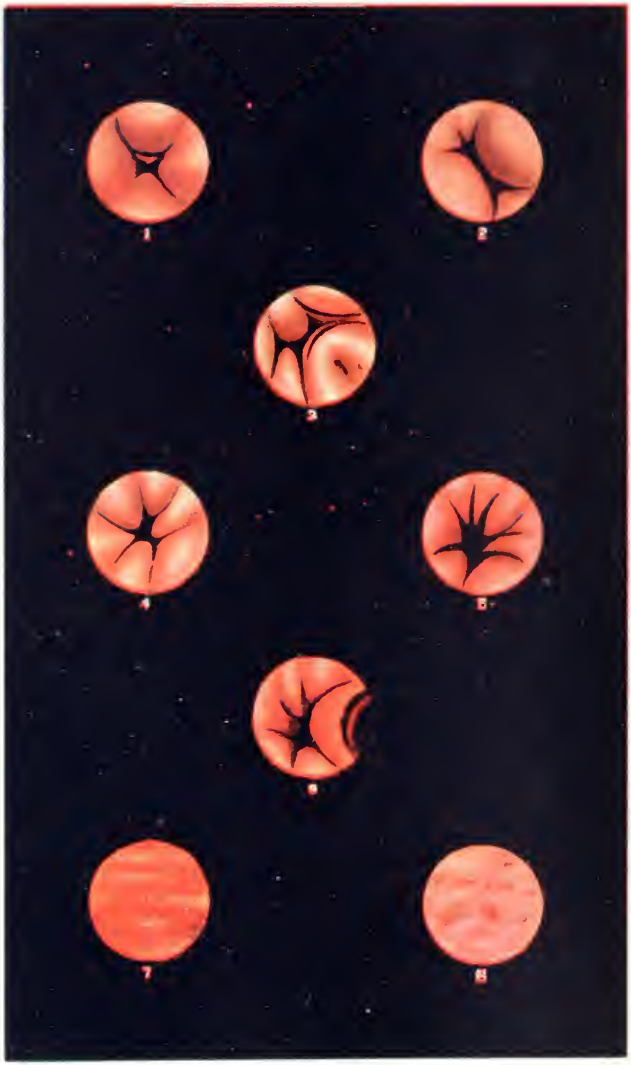

PLATE XX.

GASTROSCOPIC EXAMINATION.

Dr. Chevalier Jackson, Pittsburg, U.S.A.

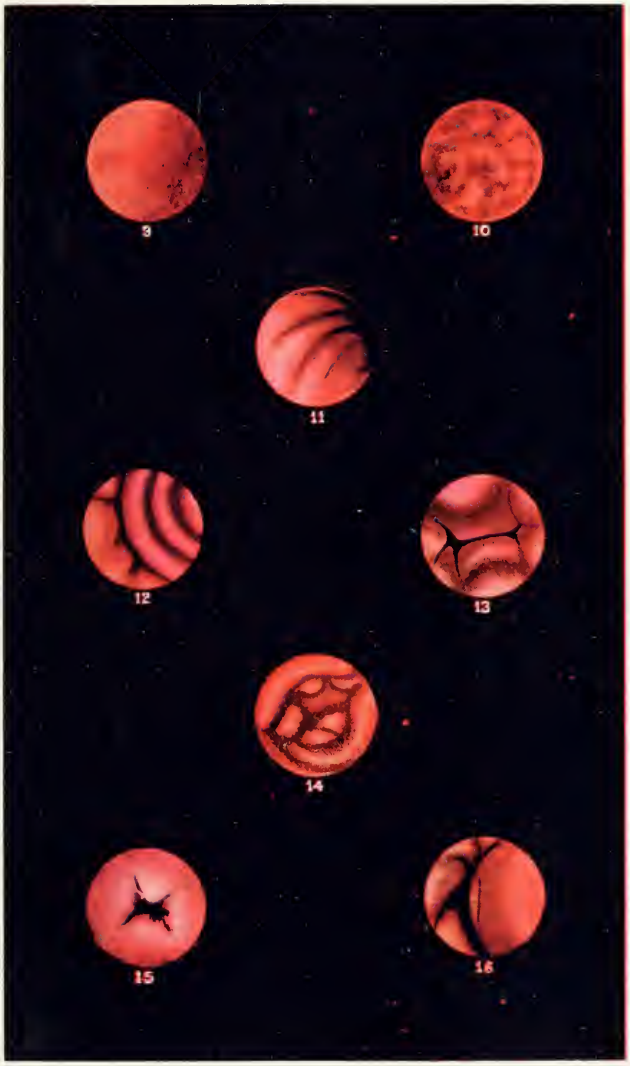

PLATE XXI.

GASTROSCOPIC EXAMINATION.

DR. CHEVALIER JACKSON, PITTSBURG, U.S.A.

condition: chronic gastritis 6 cases, gastroptosis 3, gastrectasia 2, malignant disease of cardia 3, malignant disease of pylorus 3, malignant disease of lesser curvature (specimen taken in two instances) 3, peptic ulcer 8, peptic ulcer cured (?) 1, negative results of value 1, foreign body removed 1, gastric syphilis 1.

References.—*Ann. Otol. Rhinol. and Laryng.* (Fraenkel Festschrift), Dec. 1906; *Arch. Internat. de Laryng. Rhinol. et Otol.* Juin–Juillet, 1907; *Med. Rec.* Ap. 6, 1907; *Jour. Amer. Med. Assoc.* Oct. 26, 1907; *Amer. Jour. Med. Sci.* July 1908; *Tracheobronchoscopy, Esophagoscopy and Gastroscopy*, St. Louis, Mo., U.S.A.

GINGIVITIS.

(*Vol.* 1895, p. 473)—When possible, remove the cause (e.g., mercurial poisoning). Begin with a saline purge; order oranges and lemons to be taken freely, for the sake of their acids. **Listerine** should be applied night and morning on the tooth-brush. In obstinate cases powdered **Copper Sulphate** is to be packed beneath the edges of the gums with a wooden point for several successive days; then the patient is to use the following mouth-wash: Potass. Chlorat. ℥ij, Sodii Biborat. ℥j, Potass. Nitrat. ℥ss, Tinct. Arnicæ ℥ij, Aq. Rosæ ad ℥viij.

GLANDERS. *E. W. Goodall, M.D.*

Two cases of this disease observed by H. W. Bruce and H. H. Rayner[1] in the Southwark Infirmary illustrate a point in the diagnosis which is apt to be forgotten, viz., that in the human subject a discharge from the nose may be absent or, if present, may not appear till shortly before death. In both the cases now referred to, men of 57 and 33 years of age respectively, this symptom occurred only within twenty-four hours of death. During this period also a copious eruption of pustules rapidly developed, in one case over the entire body, in the other on the face and neck. The younger patient presented acute inflammation of the right knee-joint. In both cases there were subcutaneous abscesses or inflammatory effusions in different parts of the body; the symptoms were those of pyæmia of uncertain origin, since no source for the general infection could be found. One of the patients was a cab-driver; the other was a window-cleaner, and no connection with horses could be traced in his case. The diagnosis was made chiefly on bacteriological evidence.

A. Silkman[2] says glanders is by no means so rare as is generally supposed, at any rate in New York and its neighbourhood. There it is usually mistaken for typhoid fever, acute pneumonia, or acute rheumatism. The author gives a detailed account of five cases, all of which were wrongly diagnosed in the first instance. Some of these presented special points of interest. In one, the patient's blood-serum agglutinated the glanders bacilli in dilutions up to 1–2000; in another case the patient, after he had been ill two weeks, showed four or five yellowish areas on the margin of the tongue, a quarter to half an inch in diameter, covered with a yellowish membrane which was quite firmly adherent. At the left angle of the mouth was a similar yellowish area. The patches were slightly elevated, and there seemed to be no loss of substance. There was also in this case a diffuse eruption over the trunk composed of small macules about

the size of a pin's head, lying deep in the substance of the skin. They disappeared completely on pressure; a few days later they had disappeared. The right knee-joint was inflamed. In a third case the disease first showed itself three days after a wound of the thumb, inflicted while administering a bolus to a horse which appeared healthy at the time, but which was found by the mallein test to be glandered. In a fourth case the larynx was found post mortem to contain three small yellowish buds, surrounded by a zone of congestion. Silkman states that orchitis may or may not be present in human glanders; but it did not occur in any of the five cases he relates. With regard to the cutaneous pustules so commonly met with, the author states: "These pustules are characterized by rough, uneven ulcerations around the edge of each, and rupture will disclose the contents to be a small amount of yellowish matter. Removal of the tissue covering will discover the true farcy ulceration, a peculiar characteristic of which is that immediately prior or subsequent to death an anæmic, whitish areola surrounds it; this, I believe, is a pathognomonic lesion of glanders."

References.—[1]*Med. Chron.* Ap. 1908; [2]*Med. Rec.* Oct. 5, 1907.

GLANDULAR FEVER.

E. W. Goodall, M.D.

This is an acute infectious disease which was first recognized by E. Pfeiffer, of Wiesbaden, in 1889. Since that year outbreaks have been reported in Germany, France, the United States, and Ireland by several writers; but it is not an affection that is commonly met with. Sporadic cases of the disease may occur. Two such have recently been reported by Glenn I. Jones,[1] of Washington, D.C., and from his commentary on them the following remarks are taken: Exposure to damp and cold is thought to have some relation to the disease. Children form the majority of the patients—80 per cent of all recorded cases. The period of incubation is from five to seven days. The onset is usually sudden, headache, pain in the abdomen, vomiting, and anorexia being the most common initial symptoms. The bowels are confined, the tongue is coated, and the temperature is raised to 102° or higher. The glandular enlargement is observed from the second to the fifth day. The glands which are first affected are those under and in front of the sternomastoid muscles. They seldom attain a larger size than a pigeon's egg, but they are very tender. There is no redness or swelling of the skin over the glands, which are freely movable. The enlargement persists for two or three weeks. After the cervical, the axillary, inguinal, and mesenteric glands are involved. The swollen glands subside without suppuration. Frequently the spleen and liver are also enlarged.

As enlargement of the lymph-glands is commonly met with in many acute diseases, the diagnosis may be very difficult. In *acute leukæmia* the leucocytosis is marked and persistent, the number of white cells being in the proportion of 1–30 to 1–50 red; there is marked anæmia; the illness is of longer duration than glandular fever. In Hodgkin's

GLAUCOMA.

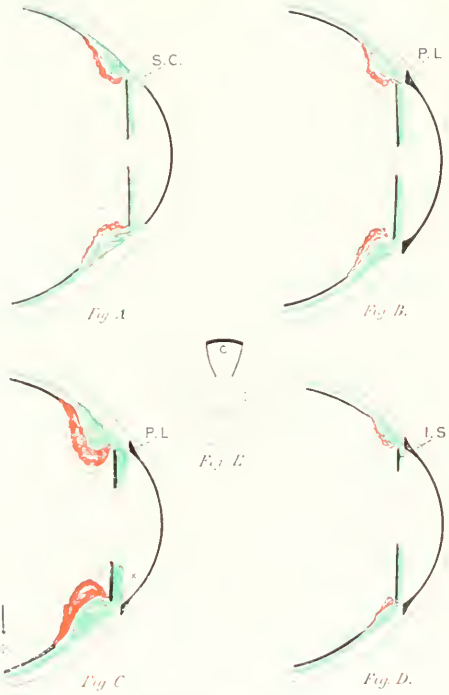

Fig A *Fig B.* *Fig E* *Fig C* *Fig D.*

Descriptive Diagrams.

Red — Arterial Area and Aqueous Inflow. The transudation of the aqueous by the ciliary body depends directly on the arterial blood-pressure.

Green — Venous Area and Aqueous Outflow.

Blue — Passive Areas of the Iris Epithelium and Cornea Endothelium, and in *Figs B, C and D*, the occluded Pectinate Ligament.

Fig. A. Aqueous Outflow in the Normal Eye, which takes place not only through Schlemm's canal but also through the iris, ciliary body, and venæ vorticosæ.

Fig. B. Available Outflow in an eye with tendency to Glaucoma, i.e., in which, through Fibrosis, there is obstruction of filtration through the pectinate ligament (P.L.). The work of drainage is thrown on the iris and ciliary body.

Fig. C.—Acute Glaucoma. Increased blood-pressure causes increased transudation of Aqueous, which cannot readily get away owing to the obstruction of the Pectinate Ligament (P.L.). The resulting increased intra-ocular pressure produces difficulty in the venous return, hence swelling and œdema of the Uveal Tract. This in the case of the Iris causes the apparent bowing of the filtration angle.

Fig. D. Iridectomy for Glaucoma. Through the iridectomy stump (I.S) the absorbing area is increased and made more efficient owing to the raw surface presented to the aqueous by which it can readily escape.

Fig. E. Surface view of Iris showing extent of cut area forming the base and pillars of the iridectomy.

disease the glandular enlargement is at first unilateral, and is accompanied by progressive emaciation and anæmia. *Tuberculous* and *syphilitic* glandular enlargements are recognized by the medical history of the case and the presence of other lesions. *Influenza* does not often present enlargement of the glands. Glenn Jones concludes his paper by observing that he believes acute glandular fever to be a very common disease, unrecognized, and that it frequently is mistaken for aberrant forms of typhoid or influenza. From his observation and study of cases, he has become firmly convinced that some cases of enteric fever of short duration have been nothing other than acute glandular fever, and that this disease should be given a more prominent place than it has among acute infectious diseases, occurring not only among children, but among adults as well.

Reference.—[1]*Amer. Jour. Med. Sci.* Mar. 1908.

GLAUCOMA. *Ernest E. Maddox, M.D., F.R.C.S.*

Etiology.—A new theory of the etiology of glaucoma has been added to the several already existing, by Thomson Henderson,[1] who suggests that sclerosis of the fibrous structure of the pectinate ligament, with consequent closing of its interspaces, accounts for all forms of glaucoma. The duty of absorbing more aqueous is thus thrown upon the iris, or rather upon its crypts. Henderson has shown that absorption is confined to the crypts, which become closed as the pupil dilates. He believes the iris to become swollen, œdematous, and congested in consequence of the increased absorption, but without advancing definite proof thereof. It is this condition which he surmises makes the iris root become applied to the pectinate ligament so as to still further block the angle. He accounts for the shallowing of the anterior chamber by the lens assuming a more globular form, owing to relaxation of the suspensory ligament from œdematous swelling of the ciliary body, brought about in its turn by pressure on the venæ vorticosæ. The absence of myopia, however, seems to render this explanation open to question.

The same original worker has contributed a valuable observation, namely, that after an iridectomy, the iris stump never cicatrizes, and his view is that iridectomy thus opens up a permanent channel for the intra-ocular fluids to drain away. Henderson's theory is illustrated by the figures on *Plate XXII.*

He has also put forward[2] some rather new views on the anatomy of the region concerned in the drainage of the aqueous chamber, looking upon the two vascular circles of the iris as venous rather than arterial, and by a careful series of radial sections of the eyeball finds that the blood from the iris and a greater portion of the ciliary body is returned by way of between forty and fifty anterior perforating scleral veins, and that Schlemm's canal is only an offshoot from these vessels. Increased intra-ocular tension, by raising the intravenous pressure, will cause congestion of these linked venous systems within the eye. Under such circumstances the blood from the whole of the

ciliary body will tend to find the nearest exit, which is forward, through the anterior perforating scleral veins, and the additional congestion of the iris leads, according to Henderson, to further failure of filtration and the production of a vicious circle. The adhesion of the iris root by a process of congestive œdema, and the occlusion of the angle of the anterior chamber thereby, is altogether a secondary manifestation which depends entirely on the acuteness and degree of the congestion. He has never found Schlemm's canal occluded as the result of pressure, but in long-standing cases, with adhesion of the iris root, he states that newly-formed vessels were always to be traced, perforating the pectinate ligament and Schlemm's canal, this being nature's method of short-circuiting the circulation and facilitating the outflow.

These anatomical investigations, which await confirmation by others, are of great interest and will stimulate enquiry. Even if fully confirmed, however, other important factors in the etiology of glaucoma cannot be overlooked, and more particularly the gradual growth of the crystalline lens through life demonstrated by Priestley-Smith, and the consequent narrowing of the perilenticular space, more particularly with small corneæ.

Diagnosis.—Strange though it may appear, quite a number of cases of chronic or subacute glaucoma are still annually mistaken for cataract in country districts, and allowed to go on to permanent blindness with the idea that the cataract is becoming ripe. The explanation of the oversight is that lenses of old people reflect so much light, owing to the greater optical density of the peripheral layers, however transparent they may be, that when the pupil undergoes the irregular and sluggish dilatation characteristic of glaucoma, the exposed lens has a rather opaque look which deceives the naked eye, added to which the cornea appears sometimes dim and steamy. It would not be surprising to learn that one or two hundred cases of this kind occur in this country every year, representing a lamentable and unnecessary loss of eyes that might readily have been saved by a little more caution in diagnosis. The most simple use of the ophthalmoscope, even by one unable to examine for a cupped disc, would show the retinal reflex in these cases to be unobstructed by an opacity in the lens ; and in most cases the tension of the eyeball will also be found sufficiently increased to make the diagnosis conclusive. It is true that in general practice glaucoma does not occur with sufficient frequency to keep a physician's fingers in good training for the testing of tension, and it may be suggested as a way of overcoming this disability, for those who feel conscious of it, to frequently test the tension of normal eyes, making a habit of doing so whenever occasion arises for inspecting the conjunctiva or the pupil. There is quite sufficient variation of tension in healthy eyes to give the fingers excellent practice in detecting the difference between a high and a low normal.

The presence of a dilated, and especially an ovally dilated, pupil, when combined with apparent opacity of the lens, should always arouse suspicion, as also the existence of a few dilated veins in the episcleral

tissue, terminating suddenly a few millimetres from the cornea. Transient attacks of misty vision, especially if they clear up after rest and food, are extremely suggestive of incipient glaucoma, as also are coloured haloes round lights.

It is not well, however, to depend too dogmatically on the presence or absence of coloured haloes, since many eyes go to complete blindness from glaucoma without these once making their appearance; while in other cases they are produced by mere mucous conjunctivitis. It need hardly be said, nevertheless, that their existence always calls for very careful examination. The patient should be asked to say whether the red edge of the halo is on the inner or on the outer side of the circle. In glaucoma it is the latter. Patients frequently say they see coloured haloes when they mean something quite different. An important point is to ensure that a perfect circle is seen, that is to say, like a child's hoop, with a considerable dark interval between it and the flame, the interval increasing, or in other words the circle expanding, the further the flame is removed. Impressions of colour which appear in actual contact with the flame have a different etiology. The discovery of a clear lens by focal or ophthalmoscopic illumination, the characteristic cupping of the optic disc, the restriction of field, and above all, the tension of the globe, suffice to place the diagnosis of glaucoma beyond question. Glaucoma, when acute, is not mistaken for cataract, but for conjunctivitis or scleritis. When associated with iritis, as it is so apt to be in gouty persons, attention is often devoted to the iritis, and the glaucoma overlooked until the eye becomes nearly blind.

The discovery of Bjerrum, many years ago, that when the field of vision in incipient glaucoma is tested with a minute object, a band-like scotoma is generally discoverable, running up from the periphery of the field towards the optic nerve, has been confirmed by many writers, and has led to special scotometers for the purpose. Priestley-Smith's has already been described in a previous volume. Mr. Bardsley has brought out a pattern with ingenious mechanism for measuring small scotomata in any part of the field.

Treatment.—Posey,[3] of Philadelphia, has communicated his impressions gathered from a series of sixty-five cases of simple chronic glaucoma. He has learned the importance of beginning myotic treatment with drops sufficiently diluted to avoid spasm of the ciliary muscle, their strength and frequency being then rapidly increased until the pupil of the eye under treatment attains a considerable degree of contraction, to be maintained during the remainder of life. In this he is right; **Pilocarpine,** too, is undoubtedly more appropriate than eserine for the preliminary treatment of cases of this character. Eserine is a congestive remedy, and instances have been observed in which chronic glaucoma has been aggravated by its use in the hands of those who are fond of it. After a time eserine may often be gradually introduced with advantage, and cases are met with in which the perennial use of even a 1½ per cent solution is necessary. As Posey remarks, conjunctival irritation may be avoided by employing fresh

and sterile solutions of the drugs, accompanied by the frequent use of cleansing washes. The general health of the subject naturally requires every attention, especially the blood-pressure and the condition of the blood-vessels. He confirms the general view that refractive errors should not only be carefully corrected, but be re-tested at intervals which are not too great, moderation in the use of the eyes being a matter of considerable importance. To this may be added abundance of sleep, and the avoidance of prolonged fasting or excessive fatigue. In the writer's experience periodical manipulation of the eyeball has proved of great service, one patient, for example, having volunteered the information that she always sees much better the day after. Incipient glaucoma has more than once been entirely dispelled by it, and in cases otherwise intractable, the disease has been kept at bay. It does not suit all cases, however. Hot sponging of the eyes at night is frequently to be recommended.

The remarkable effect of **Iridectomy** has hitherto baffled explanation. Henderson has advanced a new and possibly correct theory, that it allows the escape of the aqueous into the stroma of the iris along the cut edges. He points out that no cicatrizing process takes place in the iris after iridectomy. The weak point of this theory is that owing to the removal of a certain amount of iris, its crypts and natural absorbing facilities are lessened to an extent which one would suppose would not be much compensated for by the narrow line of the cut edge. However, the theory appears more tenable than previous ones. All are agreed as to the extreme value of iridectomy in acute and subacute glaucoma.

As to its efficacy in chronic glaucoma, opinions differ. The writer believes strongly in iridectomy if the slightest increase of tension exist, feeling sure that the sight is greatly prolonged thereby in the majority of cases, though the operation is not one likely to arouse much enthusiasm in patients, and often indeed no thanks, since there is no actual gain of sight, and sometimes even a slight operative diminution, the diminished sight, however, being greatly prolonged.

In purely nervous glaucoma an exception should be made, unless the tension should be considerable. In simple glaucoma, i.e., with no rise of tension whatever, operation is probably useless, but many are called simple which are not so.

Lagrange's operation for glaucoma was figured and described in the last volume of the *Medical Annual*, its object being to secure a subconjunctival fistula to allow the aqueous to escape into the lymph spaces of the episcleral tissue. Other operations to effect the same end have been worked out by Col. Herbert. Beginning by merely making an ordinary iridectomy with a jagged incision, he gradually evolved what is known as the wedge-isolation operation, in which the corneal flap is terminated by two bifurcating incisions, one completely through the limbus, and the other branch incision forward, so as to isolate a wedge-shaped extremity of the corneal flap, leaving it attached

only to the overlying conjunctiva. In this way a narrow strip of sclero-corneal tissue is isolated immediately above the upper visual corneal margin. Through its attachment to the conjunctiva it usually becomes a little displaced forwards after the operation by the accumulation of aqueous under that membrane, and is then prevented from uniting with the tissues from which it has been divided. Being nourished afterwards mainly or solely through its conjunctival connections, it is supposed to shrink a little in the same way that a graft would do, and by its shrinkage to leave a chink through which the aqueous can drain. A long conjunctival flap is made but not completely divided. In a few cases the operation is too successful, the fistula allowing the aqueous to escape so rapidly that the eye remains very soft, a condition of things rather dangerous for the retina if allowed to continue too long, besides being open to the danger of sympathetic ophthalmitis, though no case of the latter has yet occurred to the author of this operation.

The relative advantages of Lagrange's and Herbert's operations remain to be defined by experience. Neither of them is necessary in ordinary cases of acute glaucoma, which respond almost uniformly well to the simple iridectomy which it is customary to perform, but there are some eyes in which the glaucoma is obdurate, rendering the production of an artificial fistula of great value.

The *non-operative treatment* of glaucoma is a subject which has received but little of the attention which it deserves. The practice of instantly performing iridectomy on every case of acute glaucoma, though it has so much in its favour, appears in danger of becoming too universal. Undoubtedly there are certain kinds of even acute glaucoma in which it is unnecessary, this being specially true of traumatic and frankly gouty cases. A blow, e.g., on the eye may start an acute glaucoma, which will not recur if it can be cured without operation, and it is a great advantage to escape the disfigurement for life of a coloboma in the iris. In glaucoma due to an acute attack of gout in the eye, a powerful anti-gouty treatment, combined with local abstraction of blood, and continuous application of electrically heated flannel, will in many cases effect a cure. It deserves a thorough trial before performing iridectomy. The latter should not, however, be deferred an hour longer than can be avoided, if it becomes necessary. The writer has seen many cases of glaucoma yield to the above combination of treatment, which would have been considered curable only by operation in bygone years. On the other hand, to operate too seldom would be even worse than to operate too often. There is a perfect balance to be sought, and the value of iridectomy is, in the present day, so fully understood that a great embarrassment is removed. Happily the plaint of Donders has long lost its *raison d'être*: "Humanity urgently requires that prejudice and ignorance should no longer oppose the use of iridectomy in glaucoma."

References.—[1]*Ophth. Rev.* Sept. 1907; [2]*Trans. Ophthal. Soc.* 1908, p. 167; [3]*Jour. Amer. Med. Assoc.* Oct. 1908.

GOITRE. (*See* THYROIDECTOMY.)

GOITRE, EXOPHTHALMIC. *Robt. Hutchison, M.D.*

Opinion is still much divided as to the value of the serum treatment of this disease. Two preparations are in use for the purpose: (1) **Rodagen**, a precipitate prepared from the milk of thyroidectomized goats; (2) **Antithyroid Serum** (Merck), which represents the blood-serum of thyroidectomized sheep. The dose of rodagen is from 5 to 30 grams (75 to 450 grains) daily, given in cold milk; that of the serum from 5 to 20 drops thrice daily. Both preparations are very expensive, rodagen costing about four shillings an ounce and anti-thyroid serum about five shillings per 10 cc. Blumenthal[1] reports favourably of the results obtained with both preparations, and can find no essential difference between their effects. It must be remembered, however, that he was one of the introducers of the serum treatment. Hector Mackenzie,[2] on the other hand, has found no benefit from the antithyroid serum, and is very doubtful about the value of rodagen. Michell Clarke[3] has treated three cases with rodagen; the patients improved, but not more than most cases improve by rest in hospital, and he was not able to trace any distinct effect from the remedy. Edmunds[4] has given the fresh milk of thyroidless goats prepared by himself, in quantities of 1½ pints per day. He records three cases so treated, but the results do not appear to have been very striking.

The application of **X Rays** to the thyroid has been tried by several observers, but here again the results are disappointing. They seem to reduce the size of the goitre in some cases, but without influencing the general symptoms, nor is the reduction in the size of the gland always permanent.

Mackenzie is convinced that **Diet** plays an important part in treatment. He recommends plenty of fruit, vegetables, cream, bread, butter, and eggs, but very little meat or milk. Hanna Thomson[5] is even more emphatic on the dangers of meat, and says that it should never be allowed. On the other hand, he highly praises milk, preferably in the form of koumiss, as an article of diet, and believes that a diet of it alone will cure cases. Next to a purely milk diet, vegetarianism is most to be recommended.

Stiller[6] speaks very favourably of the effects of **High Altitudes.** He has seen quite a number of definite cures, and has rarely failed to obtain notable improvement. The stay in the mountains should be for several months, and should be repeated for several years.

As regards drugs, Thomson believes in **Phosphate of Soda** (30 gr. at the beginning of each meal), and gives a mercurial purge twice a week. He also uses intestinal antiseptics freely, such as **Sodium Benzoate** and **Naphtholene.** If the goitre is large, Mackenzie does not hesitate to give iodine, preferably in the form of **Iodipin** (1 to 3 dr. of the 10 per cent. solution daily). Jackson and Mead,[7] in reporting on eighty-five cases treated by themselves, speak highly of the **Neutral**

Hydrobromide of Quinine given in 5-gr. capsules three times a day. They state, however, that the patient must be prepared to take the drug for months or even years.

English surgeons appear to be still afraid of **Operation** in exophthalmic goitre, but in Germany it is often undertaken with apparent success. According to v. Bruns,[8] the mortality in cases treated medically is 12 per cent; that after operation from $3\frac{1}{2}$ to 12 per cent; but in the majority of the cases treated surgically medical measures have already failed. Garré performs thyroidectomy, or ligature of at most three arteries, and uses general anæsthesia. Of twenty-eight cases, four were cured, ten were so much improved that they could return to work, six were only slightly benefited, three were not improved at all, one died. Klemm[9] reports on thirty-two cases, all of which recovered after operation. He uses local anæsthesia, with excision of part of the gland, along, if necessary, with ligature of one of the arteries. It is important that the patient should rest for two or three months after the operation, preferably at a moderate altitude in the mountains. Of twenty-seven cases followed for a long time, twenty-five were cured, one improved, one unaffected. Klemm regards as a "cure" a case in which the objective signs disappear and in which the subjective condition is so much improved that the patient can resume his occupation.

Crile[10] regards the immediate risk as the serious bar to operation. This risk is not shock nor hæmorrhage, but hyperthyroidism. Seeing that operation upon parts of the body other than the thyroid is quite as fatal in acute Graves' disease as operation upon the gland itself, he considers that it is "psychic irritation" which induces hyperthyroidism. The element of "psychic irritation" can be obviated by what he calls "stealing the gland," i.e., removing it without the patient's knowledge. How this is done is best shown by a quotation: "If, then, Graves' disease is surgically curable, and if one of the greatest factors in the surgical risk is psychic excitation, the operation should be performed without the patient's knowledge. Such an operation was accordingly planned and found to be readily accomplished by securing from the patient consent to enter the hospital to be treated either medically or surgically as I thought best, without further discussion. On entering the hospital a non-operative routine treatment is first employed. The object of this is minimizing the disease phenomena and studying the case. In addition to the routine, consisting of baths, diet, etc., every morning my trained anæsthetist, who is gentle and tactful, goes through the complete form of administering anæsthesia under the guise of inhalation treatment. On the ether mask are dropped solutions of volatile oils. The patient's friends are told that the date of operation would be determined by the patient's condition. The clinical phenomena in these cases run an uneven course. Within a few days or a week we usually recognize the cycles of the disease. In the optimum portion of this cycle operation is performed. The evening prior to operation the patient is given

bromides; in early morning, if the conditions are favourable for operation, a hypodermic of morphia is given. The shades of her room are kept drawn and absolute quiet maintained. In this manner the patient is brought as nearly as possible to a negative psychic state. The operation is done at an early morning hour. At this time the anæsthetist repeats the so-called inhalation treatment. The volatile oils are again dropped on the cone, and the patient is told that this inhalation will be stronger, and that possibly a sore throat may result, but that the doctors say that this will be the last inhalation required. Gradually the ether is added drop by drop, and imperceptibly the patient passes into the second stage of anæsthesia. She is then promptly sent to the operating-room, and the operation is performed in the usual way. The only change recently made in the technique is that of securing the blood-vessels by means of a long needle threaded with catgut, at the four poles of the gland tissue near the posterior capsule, leaving a portion of the gland. After tying these four ligatures, the principal blood-supply of the gland is controlled. The gland tissue is then cut away, leaving only portions of each lobe. After this the raw surface is treated with very hot water, almost boiling, to control and destroy the superficial secretion and minimize oozing. The operation is performed with the least possible trauma upon the gland."

His results are as follows: "Among twenty-eight cases of Graves' disease operated prior to the adoption of the present method, the mortality rate was four. In the thirteen cases operated by the new method, all of which were of a fair or a high degree of intelligence, and nine of which were of the severe toxic type, we succeeded in every instance in performing the operation without the patient's knowledge. The pulse-rates prior to and during the anæsthesia and operation showed but little change. Sometimes the pulse rose a little, at other times it fell. The usual abrupt circulatory changes attending operations for this disease did not appear. Four of these cases were of the bed-ridden type, manifesting a running fever, a pulse-rate from 120 to 170, acute dilatation of the heart, acute gastro-intestinal disturbances, and violent psychic storms. They were no less severe than the four fatal cases previously mentioned. There was the usual post-operation goitre rise in temperature and in pulse-rate, but all the cases made good recoveries."

References.—[1]*Folia Therap.* April, 1908; [2]*Clin. Jour.* Oct. 30, 1907; [3]*Brist. Med.-Chir. Jour.* Sept. 1907; [4]*Lancet*, Jan. 25, 1908; [5]*Amer. Jour. Med. Sci.* Mar. 1908; [6]*Mediz. Klinik.* Mar. 1, 1908 (ref. in *Brit. Med. Jour.* April 18, 1908); [7]*Bost. Med. and Surg. Jour.* Mar. 12, 1908 (ref. in *Med. Rec.* Mar. 28, 1908); [8]Ref. in *Ther. d. Gegenw.* June, 1908; [9]*Ibid.*; [10]*Ann. Surg.* June, 1908.

GONORRHŒA. *J. W. Thomson Walker, M.B., F.R.C.S.*

In a discussion on the treatment of gonorrhœa in the male, before the Chelsea Clinical Society, Mr. J. G. Pardoe[1] expressed the opinion that it was useless to attempt abortive treatment forty-eight

hours after the beginning of the symptoms. The patient must come under treatment when the symptoms amounted simply to a slight itching at the meatus and gumming of the lips, with a little seropurulent sticky discharge. The abortive treatment need not be attempted after acute yellow or greenish-yellow discharge had commenced. *Abortive treatment* was carried out by painting the whole of the mucous membrane from a little behind the obviously inflamed part forwards to the meatus with nitrate of silver by means of the urethroscope. Another method was by limited anterior injections. The urethra was lightly anæsthetized, and was blocked by pressure of the finger and thumb at the peno-scrotal angle. An injection of **Protargol** (10 per cent) or **Silver Nitrate** (2 to 4 per cent) was then made and repeated after forty-eight hours. Two injections were sufficient. Another method was by anterior irrigation. Five irrigations should be given, one each night and morning, of **Permanganate of Potash** (1–1000) the backward flow being restricted in the same manner as before. Where the discharge was already well established, the course might be modified in a considerable proportion of cases by irrigation with permanganate of potash (1–5000 up to 1–1000) the discharge disappearing in two or three days, but further treatment was required to prevent recurrence. There was some risk of setting up acute prostatitis, vesiculitis, and epididymitis by this method, and on this account the treatment should be carefully limited to the anterior urethra, and the patient should not be allowed to carry out the treatment himself. As regards *expectant treatment*, which consisted in the administration of **Alkalies, Diuretics, Sedatives,** and **Rest,** he prohibited the use of injections until the acute symptoms had subsided, about the third or fourth week of the disease. In acute posterior urethritis irrigation was totally unjustifiable. These cases were best treated by hip-baths, suppositories, and various alkalies and urinary sedatives. A certain degree of success had been attained by the use of **Serum** and **Inoculation Methods,** especially in the fulminant type of disease. Polyvalent streptococcic serum and gonococcus vaccine had been used.

In the discussion, Mr. Charles Ryall advocated active treatment where acute posterior urethritis or epididymitis was present. If the acute posterior urethritis does not yield to irrigation of permanganate of potash, he recommends applications of solution of nitrate of silver (5 or 10 gr. to the ounce) to the posterior urethra. Acute epididymitis is similarly treated.

Epididymitis.—Discussing the complications of gonorrhœa, Mr. A. Baldwin recommended the following treatment for *acute epididymitis* :—

R Tartrate of Antimony	gr $\frac{1}{6}$	Peppermint Water	℥j
Sulphate of Magnesia	℥j		

To be taken every one or two hours until the patient is sick or until six doses have been taken. Rest in bed, with glycerine of **Belladonna** and fomentations, and an ointment of equal parts of lanolin and guaiacol, were recommended. When the inflammation begins to subside, equal

parts of belladonna ointment and compound **Mercury Ointment** were applied and the fomentations continued. The ointment is continued and a suspender worn when the patient is allowed up. When the tenderness subsides, compound mercurial ointment is rubbed into the induration daily, being discontinued for a few days if the scrotum becomes irritated. When the first medicine is omitted the patient is given sodium salicylate gr. 10, potassium iodide gr. 5, three times daily. If the induration is not absorbing satisfactorily, the potassium iodide is increased and a drachm of liquor hydrargyri perchloridi added. The writer believes that the hypodermic injection of **Fibrolysin** (3 gr.) or **Thiosinamine** (3 gr.) and salicylate of soda (3 gr.) is useful. One dose is injected under the skin of the back each day.

Schindler[2] advocates **Puncture** as a therapeutic method in the treatment of gonorrhœal epididymitis. In all cases where there is fever, excessive pain or extensive infiltration, multiple puncture should be performed. The effect is beneficial even if no pus is removed. Pain disappears, and tension and tenderness diminish, and the temperature falls. Usually a small quantity of turbid gonococcal pus is obtained. Puncture is practically painless, even when the testicle is very tender, and Schindler does it in out-patient practice at hospital without a local anæsthetic. The induration was absorbed in about half the time common in cases treated by the usual methods. This writer had not such marked success with Bier's method of artificial hyperæmia applied to acute epididymitis, and the duration of treatment was not shortened.

In the *early treatment* of gonorrhœa in the male, Wyndham Powell[3] recommends the following methods: The time since the exposure and the appearance of symptoms is noted. The patient should not have urinated for an hour or two. The terminal inch of the urethra is pressed to see if any discharge can be made to appear, and this is examined microscopically. An irrigator is filled with two pints of sterile water at a temperature of 98° F. and raised five or six feet above the penis. The patient compresses the penis at a distance of two inches from the meatus, and this extent of urethra is washed with the sterile water. The patient now grasps the penis with the thumb and one finger behind the scrotum, and the next two or three inches of urethra are washed. The bulbous urethra is now washed without any compression with the fingers, taking care not to force fluid into the posterior urethra. This is done thoroughly, ballooning the urethra and allowing the contents to escape. The patient now urinates into a clean glass. The presence or absence of filaments in these washings, the clearness of the urine and its freedom from shreds, give roughly the necessary information as to the extent of the disease. In a relapsed gonorrhœa there are generally filaments in all the washings, and often in the urine also, and the discharge is apt to appear the day following the intercourse. If the patient is seen within a few hours of the initial symptoms, and the surgeon is satisfied that the inflammation has not spread deeper than two inches, a solution of **Nitrate of Silver** is introduced with an eye-dropper into this part of the urethra, while the patient grips the penis two inches from

the meatus to prevent the solution from going deeper. The process is repeated six or eight times, one or two minutes being taken over it. The urethra is manipulated gently while the solution is held in so as to penetrate any duct or lacuna.

If the disease is more than a few hours old, it depends upon the acuteness, as shown by redness, œdema, and irritation, whether the silver process should be undertaken or not. In first acute attacks, and always if in doubt, the silver should be omitted. Otherwise it may be used up to thirty-six or even forty-eight hours from the beginning of the symptoms, provided there are no shreds beyond the part intended for treatment. In these cases two to two and a half inches of the urethra may be treated with a 1 or 1½ per cent silver nitrate solution, and immediately followed by an irrigation of the whole anterior urethra with two pints of 1–2000 permanganate solution. Rest should be enjoined after this, and urination deferred for three or four hours. Twelve hours after this treatment, **Permanganate Irrigations** should be commenced, and any discharge carefully examined to ascertain whether or not the silver process has been successful, because, if not, irrigation must be continued systematically until no more gonococci are found. It is not unusual for one strong permanganate irrigation to clear up the case where gonococci have been found after the silver process, but many irrigations may be necessary. Ten drops of a 4 per cent β-eucaine lactate solution may be used to anæsthetize the anterior part of the penile urethra. Silver nitrate should never be applied to the whole anterior urethra. The silver injection is not usually repeated, but irrigations are commenced, if necessary, on the following day.

In the case of suspicious intercourse, before the appearance of any discharge, the 1 per cent silver treatment of the first one or two inches of the urethra should be used, and will prevent an attack.

If the discharge has been in existence more than a couple of days, it is better to commence with the permanganate irrigations at once. Irrigation is carried out with the following apparatus:—A piece of glass tubing 5 in. long fits on to the end of the rubber tubing which conducts the fluid from the reservoir. This glass tubing passes through a rubber stopper which fits into a glass shield to catch the fluid as it returns from the urethra and prevents splashing. A glass nozzle fits on the end of the glass tubing. The reservoir should have three pints capacity, and be raised 5 or 6 ft. above the penis for anterior and 4 or 5 ft. for posterior irrigation. The clip on the tube from the reservoir should be easily manipulated with one hand. A large funnel with a rubber tube is held by the patient to catch and conduct away the waste fluid. The apparatus rests, during irrigation, on and between the tips of the third and fourth fingers of the right hand, while the outer end of the glass stem is grasped between the thumb and the middle of the forefinger. The thumb and forefinger not only steady the apparatus, but also control the flow by compressing the rubber tube. The tension in the urethra (ballooning) is obtained by partially or completely obstructing the outflow from the urethra by compressing the meatus

rhythmically with the forefinger and thumb of the left hand above or below the point of the nozzle once, twice, or three times to the second. An irrigation therefore consists in a rapid filling and emptying of the urethra. The operator stands to the right and a little in front of the patient. The penis is steadied between the middle and ring fingers of the left hand. This leaves the thumb and forefinger free to regulate the outflow. The strength of the solution of permanganate of potash varies between 1–1000 and 1–5000 for anterior injection, the temperature from 105° to 107° F., and the quantity is three pints. For a very acute case 1–1500 solution is used twice daily for three or four days, and then the stronger solution once daily. Without laying down strict rules, the following strengths of solution are recommended in difficult cases: For hyper-acute cases, 1–2000 to 1–4000, twice daily for three or four days, then once daily with 1–1500 to 1–2000. For subacute cases, 1–2000 to 1–3000 twice daily for three or four days, then once daily with 1–1000 to 1–1500. In painless cases, 1–1000 to 1–1500 daily. Pain and œdema are the chief indications for reducing the strength. If the serous discharge becomes bloodstained, the strength should be reduced or boric acid solution substituted. Strong solutions of cocaine should not be used. Ten to twenty drops of a 1 per cent solution of cocaine hydrochlorate, or a 4 per cent β-eucaine lactate solution held in for a minute or two will tide over the actual irrigation. The region of the bulb should not be anæsthetized, as this may facilitate the passage of fluid into the bladder. When the inflammation has spread to the posterior urethra, the anterior should be irrigated occasionally.

A persistent bead of pus in the morning, occurring during irrigation, is highly suggestive of an affection of the lacunæ or of some minute canal, or of suppuration of a Littré's gland. When no more secretion can be expressed from the terminal inch of the urethra on rising in the morning, and the meatus is not glued, and there are no filaments in the urine, the case can be regarded, tentatively, as having recovered. Careful observation must, however, be kept up for another week or so, as any injurious influences, such as alcohol, excessive exercise, or intercourse, may cause a recurrence.

Abortive Treatment in the Female.—F. Bierhoff insists upon the importance of microscopical examination of scrapings of the urethra, vagina, and cervical canal as a diagnostic measure. The initial stage of gonorrhœa in the female, he says, is not accompanied by severe symptoms, so that the process obtains a firm foothold before attention is called to the disease. A fair proportion of women supposed to be healthy are afflicted with subacute or chronic gonorrhœa. When the conditions for the employment of the abortive method are favourable, he adopts the following measures. The vulva, meatus, urethra, and surroundings are cleansed and irrigated with a solution of $\frac{1}{4}$ to $\frac{1}{2}$ per cent of **Protargol** by means of a hand syringe or an irrigator. About 150 cc. of the fluid are then injected into the bladder and expelled by the patient. A vaginal scraping is examined and the vagina irrigated by a stream of the solution, finishing by blocking the outlet and thus

distending the vagina and then allowing it to flow away. A sterilized speculum is now introduced into the vagina, and the mucous membrane, the fornices, and the cervical orifice cleansed with pledgets of cotton wool. A scraping of the cervical canal is examined microscopically, and if this is found free from gonococci the vagina is lightly tamponed with several yards of absorbent gauze in narrow strips, soaked in 1 per cent protargol solution. If the vagina has been found infected, a 5 per cent solution is used. A soluble urethral bougie 1½ in. long and containing 5 per cent protargol, is left in the urethra, and a pad of cotton wool soaked in 1 per cent protargol placed over the urethral and vaginal orifices and kept in place by means of a T bandage. The patient abstains from passing water for at least two hours. Rest in bed, a bland diet, and a daily warm sitz-bath are ordered. After twenty-four hours the tampon is removed and the whole treatment repeated. After two such applications, if gonococci have disappeared, the urethral irrigation and bougie are omitted, and a vaginal irrigation of **Bichloride of Mercury** solution (1–4000) or a solution of **Zinc Sulphocarbolate** (½ per cent) is substituted for the protargol, and the tampon is omitted. Treatment is continued until gonoccoci have entirely disappeared from the urethral and cervical scrapings.

E. E. Irons[4] has published observations on forty cases of *gonococcus infection*, thirty-one of which were cases of arthritis, in which injections of **Dead Gonococci** were used. Spontaneous recovery takes place in most cases of systemic infection by the gonococcus, but a certain number of cases become chronic. In these chronic cases, which may last for years, recovery can be hastened by the injection of dead gonococci. No harm has been known to follow the injections. All the cases were injected with cultures obtained from sources other than the patient under treatment, and some of the material was prepared from two or three strains of gonococcus. Injections of 20 to 50 million organisms were given in the earlier cases, and produced a rise in the opsonic index but no change in the clinical course. The dose was then increased to 100 million, and later to 1000 million organisms. The intervals between the injections varied from three to seven days. The most constant feature in the reaction was the increase in pain and tenderness in the joints.

W. T. Butler and J. P. Long[5] record the result of the vaccine treatment of gonorrhœal *vulvo-vaginitis* in twelve children, of ages ranging from one and a half to twelve years. In nine of the cases the discharge stopped and the gonococcus had disappeared after a few weeks' treatment. In the remaining three cases the discharge recurred, but afterwards disappeared. These writers note the following points in technique. The gonococcus was readily grown in blood-serum and blood-agar. They found a considerable advantage in using young cultures from six to eight hours old. The vaccinations were administered according to the condition of the opsonic index, the normal index being determined by the average count in four healthy boys. Two vaccines were employed, one from a single case of gonor-

rhœa and the other from cultures made from four cases. Both were standardized to 20,000,000 per cubic centimetre. In the most protracted cases a change was made from the first of these to the second, with very prompt improvement in two of the cases. The authors considered that a vaccine made from cultures taken from several cases of gonorrhœa may be more effective.

The treatment of *inflammation of the Bartholinian glands* by **Bier's Congestion Hyperæmia** is the subject of an article by Plass.[6] The treatment was used in fourteen patients suffering from gonorrhœa where simple inflammation or pseudo-abscess, or abscess of these glands, was present. The treatment was only withheld in large abscesses with extensive inflammation of the surrounding tissues. Where such abscesses had been opened or had ruptured, and there was delay in healing, the method was applied with considerable success to hasten recovery. In small abscesses and pseudo-abscesses it was applied after making a small puncture with a lancet. The suction was applied, as a rule, for thirty minutes daily, usually in two sittings of fifteen minutes, and the patients were kept in bed. In most cases cure was effected in the course of the second week of treatment. The pain and the infiltration rapidly disappeared, and wounds healed rapidly.

Kanitz[7] has used **Santyl** in forty-five patients suffering from acute gonorrhœa. This is a combination of salicylic acid and sandal-wood oil which splits up in the intestines. It is a bright yellow oil, with a slight aromatic smell, is almost tasteless, and does not taint the breath. It was especially useful in posterior urethritis and where epididymitis and prostatitis were present. Kanitz concludes that the drug exerts a very favourable action upon urethritis by diminishing the discharge and relieving many painful symptoms. It has the advantage over the older forms of balsam that it is tasteless and non-irritating to the stomach and kidneys. It has no power to inhibit the multiplication of gonococci, and has no bactericidal power whatever.

Knauth[8] has treated twenty-nine cases of gonorrhœal infection by internal administration of **Arhovin**, which he says was well borne in all cases and caused no interference with digestion, no skin eruption, and no irritation of the kidneys. In the most acute stages painful symptoms such as strangury, scalding, and chordee were modified in the first day, and disappeared in, at the longest, three days. The average duration of treatment of an acute attack was thirty days. The acute inflammation remained limited to the most anterior part of the urethra, and there were no complications. In chronic cases the average duration of treatment was forty days. This observer considers that arhovin administered internally is an important substitute for the injection treatment, and since using it he has abolished the injection syringe in his practice. The doses used were 4 to 6 capsules containing 0·25 gram.

Regenspurger[9] obtained a cure of acute gonorrhœal urethritis in 78 out of 150 cases (52 per cent) by the use of **Novargan** injections combined with internal drug treatment. He only selected cases that

appeared for treatment within the first eight days, and had no complications, and did not include cases where a fresh attack had supervened on a chronic disease, or very acute cases where there was vesical irritation. He used novargan in preference to protargol on account of its higher percentage of silver and being less irritating. Regenspurger used the drug in strengths of 5, 10, and 15 per cent. In very sensitive patients, and where he used a 10 per cent glycerin solution, he added 5 gr. of antipyrin. The anterior urethra was washed out with distilled water after urination, and then 8 to 12 cc. of a 5 per cent novargan solution was injected and retained in the urethra by means of a clamp for five to fifteen minutes. The injection was repeated after twenty-four hours, and a 10 per cent solution used if no irritation were present, and the injection was continued daily, increasing or decreasing the strength according to the irritation caused. The novargan should be freshly prepared and kept in a dark glass bottle.

Gleet.—C. Gibbs[10] makes the following observations on flocculi: (1) A large, solid, yellowish-white coagulum, sinking at once, indicates an extensive area of subacute urethritis; (2) Many small, long, yellowish particles, some floating and some sinking, indicate inflammation of the lacunæ and mucous glands; (3) Long slender grey flocculi, in which is found much epithelium, indicate a healing condition; (4) A filmy grey floating flocculus, with tiny white spots in it, which shows under the microscope loose pus cells, angular cells, and small or large epithelial cells, indicates a healing patch of superficial catarrh; (5) A single long three- or four-inch flocculus, which can be drawn out on a slide and has at one end a more solid root of yellow colour, suggests suppuration of one follicle which is causing infection of a considerable length of the urethra; (6) A number of small white masses are often found in the urine of patients suffering from stricture or indurated patches; (7) A number of diminutive flakes, resembling a fly's wing, and composed of epithelium, are generally due to strong injections in a healthy urethra.

Melun[11] recommends **Ionization of Silver** in *Chronic urethritis*, and carries it out in the following manner. A straight, hollow rubber sound, 25 cm. long and number 18 calibre, is employed. From the tip nearly to the opposite end of the sound a number of small perforations communicate with the lumen. In the lumen is a silver wire which passes out through an opening near the end of the sound at a part which will lie outside the urethra. This end of the wire is connected with a galvanic battery. The external end of the instrument is fitted with a stop-cock. The instrument is inserted into the urethra until the perforated portion is covered, and the meatus is pressed round the instrument. The stopcock is opened, and 10 grams of a 1 or 2 per cent solution of silver nitrate is injected by means of a syringe into the cavity. The solution escapes into the urethra through the perforations, and balloons it. The stopcock is now closed, and the silver wire connected with the positive pole of the battery. The negative pole is placed on any part of the body of the patient. A weak current is

turned on and gradually increased to 30 or 40 ma., and continued for fifteen to thirty minutes. The silver nitrate is decomposed, and the ions penetrate the tissues, glands, and mucosa. Three cases of chronic urethritis were cured by this means.

P. Clennell Fenwick[12] has applied **Zinc Ionization** to the urethra in two cases of chronic urethral discharge, with favourable results. He passed a urethral cannula into the anterior urethra, and after having dried the mucous surface with swabs of cotton wool, passed a probe wrapped in fine lint soaked in zinc sulphate solution (2 per cent) along the cannula. The cannula was then withdrawn, leaving the probe in the urethra. The end of the probe which projected from the meatus was connected with a constant current battery (positive pole), and a big negative pad was placed under the patient's loins. Two ma. of current were passed for ten minutes without causing any pain except a slight tingling. This was repeated on two subsequent occasions, and resulted in cure where other methods had failed. In another case the canal was filled with zinc solution, which was retained by means of a thin rubber cord encircling the penis at the corona, and small straight electrodes were placed above and below the penis. A current of 5 ma. was passed.

Gonorrhœal Rheumatism.—Fuller[13] recommends the operation of **Seminal Vesiculectomy** as a cure for gonorrhœal rheumatism. He is of opinion that the systemic infection in the male usually enters from a special focus which is represented by seminal vesiculitis. In twelve out of fifteen cases of gonorrhœal rheumatism the only existing genito-urinary lesions was in the seminal vesicles, and in the remaining three cases there was inflammation of the seminal vesicles combined with urethral inflammation. This surgeon has performed the operation of seminal vesiculectomy twenty-three times for the relief of gonorrhœal rheumatism. Seventeen of these patients were cured and remained well; two remained well until they contracted a fresh attack of gonorrhœa which caused the renewal of rheumatic symptoms. In two there was a relapse which was attributed to premature sexual intercourse. These patients eventually recovered. Two very chronic cases relapsed. The most marked effect was obtained in the acute cases. The pain in the joints disappeared in twenty-four to thirty-six hours, and the swelling had subsided by the fourth day. Stiffness and atrophy of the muscles required massage and passive movement. In the chronic cases pain disappeared in a week or ten days, and at the end of two weeks massage could be commenced; in very chronic cases it may take two or three months of massage and exercise.

Gonorrhœal Arthritis.—In a report on forty cases of gonorrhœal arthritis treated by **Venous Hyperæmia**, Bätzner[11] remarks that the best results were obtained where the treatment was commenced early. In thirteen cases where the treatment was instituted within the first three to six days, recovery with complete restoration of movement was obtained. In twenty-seven cases that were commenced from the

tenth day to the twenty-first week from the beginning of the disease, irreparable joint changes resulted in six. Twelve of these twenty-seven cases recovered with perfect function, and nine with impaired function. In these cases also the venous congestion was more successful where marked inflammatory symptoms were present.

REFERENCES.—[1]*Clin. Jour.* Ap. 15, 1908; [2]*Deut. med. Woch.* Dec. 20, 1907; [3]*Clin. Jour.* Ap. 29 and June 24, 1908; [4]*Arch. f. inn. Med.* May 1908, in *Brit. Med. Jour.* Epit. June 11, 1908; [5]*Med. Rec.* Mar. 21, 1908; [6]*Berl. klin. Woch.* Ap. 20, 1908; [7]*Ther. Monats.* Oct. 1907, in *Brit. Med. Jour.* Epit. Jan. 4, 1908; [8]*Münch. med. Woch.* Ap. 21, 1908; [9]*Med. Klin.* Feb. 23, 1908, in *Brit. Med. Jour.* Epit. May 16, 1908; [10]*Pract.* Jan. 1908; [11]*Ann. des Maläd. des Org. Genito-urin.* 1907, p. 1681; [12]*Brit. Med. Jour.* Aug. 18, 1908; [13]*N. Y. Med. Jour.* May 30, 1908; [14]*Ther. d. Gegenw.* July, 1908.

GONORRHŒAL ARTHRITIS OF KNEE.[1] *Robt. Hutchison, M.D.*

This condition has long been the despair of the surgeon and the patient. At the Société Médicale des Hôpitaux of Paris, on July 26th, 1907, M. Louis Queyrat described a method of treatment which, if practised from the onset, enables the patient to walk with ease at the end of three weeks, and prevents the stiffness and ankylosis which so frequently occur. This treatment consists of (1) early aspiration, (2) energetic counter-irritation, and (3) early movement. Aspiration is performed on the outer aspect of the joint, about two fingers' breadth below the patella, after shaving and cleansing the skin first with soap and water, and then with ether. It is important that aspiration should be performed early, for after a little time very little or no fluid will be found, and the joint becomes filled with a fibrinous mass, which explains the adhesions and ankylosis. For aspiration a large needle (3 mm.) and a syringe of a capacity of 20 cc. are all that is necessary. The quantity of liquid removed amounts to 60, 80, or 120 cc. Some surgeons consider aspiration dangerous and recommend arthrotomy, but M. Queyrat does not agree with this, and finds that aspiration of the knee is as harmless as thoracentesis. He has performed it more than two hundred times without any ill result. Asepsis is necessary for these results. The treatment can be carried out by any practitioner. Arthrotomy, M. Queyrat finds, is only exceptionally necessary. After puncture he applies the pointed actual cautery 200 to 400 times (200 *à* 400 *pointes de feu*), and sears the puncture by cauterizing it. Then he applies compression to the joint methodically. Four days later progressive movements are begun. For this purpose an apparatus is used consisting of a steel support of which the upper part is bent at an obtuse angle. The free end carries a pulley over which passes a cord having at one end a weight and at the other a stirrup. The patient stretches himself in his bed, turning his back towards the pulley, passes the foot of the affected limb, which is in a state of semiflexion at the knee, into the stirrup, and performs extension of the knee. He thus raises weights varying from 1 to 30 kilos. This exercise has the triple advantage of mobilizing the knee, of combating the atrophy, which is so marked and early a feature of

gonorrhœal arthritis, and by the traction exercised by the quadriceps on the patella, of hastening the absorption of the residue of the articular effusion and preventing reproduction of fluid. The results obtained appear to be remarkable.

REFERENCE.—[1]Abst. in *Lancet*, Oct. 12, 1907.

GRAVES' DISEASE. (*See* GOITRE.)

HÆMOPHILIA.

(*Vol.* 1900, pp. 52, 240; 1902, p. 304)—**Thyroid Extract** is said to check the hæmorrhage, and the injection of **Antidiphtheritic Serum** is recommended for the same purpose.

HÆMORRHAGE, INTRACRANIAL (in the Newborn). (*See* BRAIN, SURGERY OF.)

HÆMORRHOIDS. *Sir Charles Ball, M.Ch., F.R.C.S.*

Alexander Don[1] describes an ingenious and simple method of excising piles which has the merit of not requiring special instruments and is capable of being performed under infiltration anæsthesia. The necessary instruments are: Six pairs of artery forceps, six harelip pins, a good-sized cork, a knife, and catgut sutures and ligatures. The catgut should be chromicized to prevent too early absorption. The cork is cut into a thimble shape, and a fold of gauze is tied round it, leaving a loose part beyond the ligature for a handle. The sphincter is first dilated as usual, the piles are caught all round by the six artery forceps and pulled down, and the cork then pushed into the rectum with the gauze handle protruding. The forceps are pulled upon and readjusted till the healthy mucous membrane is well in sight all round, when the plug is drawn down till the edge of the cork is just above the upper limit of the piles. The handle of the cork and the forceps, held all together in the left hand, are now pulled well down, and the pins stuck through the skin about ¼ in. outside the white line all round and sloping inwards till they pierce the cork. The pins lie outside the sphincter in the submucous tissue, and just underneath the dilated veins, and must not be pushed through the sphincter. The method of traction just described ensures the safety of the sphincter. The cork alone is now further pulled upon, and the pins thus raised to the perpendicular are stuck firmly into the cork. A double turn of thin rubber tubing, held on the stretch, is wound between the pins and the body, and forms a tourniquet, the ends being held posteriorly by a pair of forceps. The other forceps are now removed. The whole pile area may then be carefully dissected off the submucosa with the knife, care being taken to leave at least ¼ in. of skin and healthy mucous membrane in front of the pins. Any blood-clots are scraped away with the handle of the scapel. The tourniquet is now taken off. Two or three vessels at the most will require ligature, but these being held forward by the pins are easily caught up. A continuous catgut suture is next applied, with fixing interruptions at three or four places. This suture should first pick up the mucous membrane, then take a bite of

the submucosa, and lastly pick up the skin—three separate insertions of the needle. A dry gauze plug is placed in the anal canal, its end protruding, and this easily controls any oozing, and comes away usually of itself after the first day. Iodoform ointment on lint may then be applied. The sutures come away in seven to ten days, leaving a few places to skin over, but if ordinary catgut has been used, they come away too soon, and the mucous membrane retracts and leaves a wide bare area, with disastrous after-effects. This does not happen with the less absorbable catguts. No true skin is removed, and no morphia suppository is used. The action of morphia per rectum is somewhat uncertain after excision by this method. A hypodermic injection may be given later if necessary.

REFERENCE.—[1]*Edin. Med. Jour.* June, 1908.

HÆMORRHOIDS (Local Applications for).

(*Vol.* 1890, p. 427; 1891, p. 240)—External piles, when inflamed, can be soothed by the application of Bismuthi Subnitrat. ℥ij, Hydrarg. Subchlorid. ℥j, Vaselini ℥j. Internal piles may, it is said, be caused to shrivel by the persistent application of Chrysarobin in suppositories: R Chrysarobin gr. j, Iodoform gr. ½, Ext. Belladonnæ gr. ⅛, Cacao Butter gr. xxx, Glycerin q.s. For hæmorrhage Tannic Acid suppositories are indicated.

HAIR, AFFECTIONS OF THE. *E. Graham Little, M.D., F.R.C.P.*

Bulkley and Janeway[1] tabulate the nutritive and neurotic diseases of the hair, as distinguished from the parasitic diseases, as follows:—

1. Hirsuties
   - Normal or natural at puberty.
   - Abnormal
     - At the menopause.
     - With ovarian or uterine disorder.
     - In the insane.
     - Idiopathic.
2. Alopecia
   - Congenital
   - Acquired
     - Senile—normal or natural.
     - Premature
       - Symptomatic
         - After fevers.
         - In syphilis.
         - From eczema, etc.
         - From nervous shock.
       - Idiopathic.
3. Canities
   - Congenital—albinism.
   - Acquired
     - Senile—normal or natural.
     - Premature
       - Sudden—from nervous shock.
       - Gradual
         - Partial
           - Along nerve tracks.
           - In leucoderma.
         - General
           - From grief.
           - Idiopathic.
4. Fragilitas crinium
   - Symptomatic, after fevers, etc.
   - Idiopathic.
5. Trichorexis nodosa.
6. Alopecia areata.
7. Monilithrix.

Abnormal hirsuties in females in half the total number of 175 cases occurred at ages between twenty and thirty—that is, the time at which hair grows on the face in males. It is probable that sexual derangements play an important part in the production of this condition, but the limits of the age in these cases preclude considerations connected with puberty or the menopause; the facts regarding menstruation should always be carefully enquired into and noted in cases of abnormal growth of hair. Alopecia was noted in 670 cases, 62 per cent being males, and the ages from twenty to thirty-five being the most common.

The wearing of hard hats is considered a possible explanation of the preponderance in men. Seborrhœic dermatitis, specific fevers, general illnesses, pregnancy, nervous derangements, accounted for more than two-thirds of the whole number, and the authors suggest that constitutional causes would be more frequently ascertained if more careful investigation were adopted. But a certain proportion of cases must remain unexplained. Premature canities was found in association with general and nervous debility in several cases; in 20 per cent of the cases recorded hereditary factors seemed to be present in determining premature canities. Fragilitas crinium is observed chiefly in connection with debilitating diseases, and is seldom an isolated symptom. Trichorexis nodosa has, in some instances at least, been shown to be due to mechanical injury to the hair, and it is doubtful whether it should be included in this consideration at all. Alopecia areata the authors claim, with the majority of recent writers, as a non-parasitic disease, and they offer sound arguments for this view. General measures for promoting the health of the patient are much more valuable than local applications. In only one instance out of 202 cases was there more than one member of the family affected, and nervous causes seemed by far the most frequent precursors of the loss of hair. Monilithrix was observed only once in the large series of 1129 observations of disease of the hair. Its cause remains quite obscure. The authors, as a result of exceptionally extensive experience, form the conclusion that far too little attention is devoted to general considerations, far too much to local conditions, and plead for a greater and wider care in the treatment of the individual.

REFERENCE.—[1]*Jour. Amer. Med. Assoc.* July 25, 1908.

HAY FEVER.

William Milligan, M.D.
D. Lindley Sewell, M.B.

Menier[1] recommends the inhalation of **Mentholated Chloroform** (containing 4 per cent of chloroform) in conjunction with a nasal spray of a 1–2000 solution of **Adrenalin** in those cases where there is excessive secretion.

In the treatment of cases of intractable hay fever and paroxysmal coryza, E. S. Yonge[2] recommends **Resection of both Nasal Nerves** where minor measures, e.g., cauterization of the nasal mucosa, have been tried and found wanting. The nasal nerve is reached by an incision at the inner edge of the orbit, commencing just above the inner canthus and extending upwards and slightly outwards for about two-thirds of an inch. The nerve is located at the anterior ethmoidal foramen, and about $\frac{1}{4}$ of an inch resected. The results so far obtained by the author have proved eminently satisfactory.

REFERENCES.—[1]*Quinz. Thérap.*; [2]*Lancet*, June 13, 1908.

HEADACHE.

Vol. 1890, p. 282; 1892, p. 48)—Oil of **Eucalyptus** ℥v, four times daily, is recommended for paroxysmal headache. **Ext. Cascar. Sagrad. Liq.** ℥j at the outset of an attack will sometimes ward it off. **Gelsemium** in small doses is of value in the treatment of dull congestive headaches.

HEART, DISEASES OF. (*See also* PERICARDITIS.)

John Cowan, D.Sc., M.D.

Hay[1] discusses the treatment of heart disease, and in particular that of mitral stenosis. The action of the **Digitalis** group upon the heart is fourfold (Haynes). They strengthen the tonicity of the muscle, and increase its contractility, while they slow the heart either by slowing the rate of stimulus production, or by depressing the excitability. They have also a toxic action. **Strophanthus** is ten times more toxic than digitalis, and has less effect upon the contractility of the heart, and a greater slowing action. **Squills** is more valuable than either, having a greater effect both on the contractility of the heart and on the peripheral vessels, while the commercial preparations are more constant in their composition. Digitalis and squills are particularly indicated in cases of cardiac dilatation.

The usual division of cases of mitral stenosis into two stages—(1) where compensation is more or less perfect, with regular pulse and distinct presystolic murmur; and (2) with failing compensation, an irregular pulse, and no presystolic murmur—is really erroneous. Cardiac failure may occur with regular cardiac action, and arhythmia with fair compensation. Arhythmia in mitral lesions is commonly the result of nodal extrasystoles, and a rapid cardiac action of this type is much more frequently benefited by digitalis than a rapid though regular pulse in the first stage. Salines, general tonics, small doses of **Nitroglycerin** and **Belladonna,** are, however, often of value, and morphia is helpful in the treatment of dyspnœa.

The galenical preparations of the digitalis group require, according to Haynes,[2] standardization: for the glucoside content varies enormously in separate samples. Merck's crystalline digitoxin and Böhringer's strophanthin are, however, trustworthy. All this group have some influence on the peripheral vessels, that of squills being the greatest and that of strophanthus the least. Their combination with vasodilators, such as the nitrites, has been recommended in cases where vasoconstriction is not desirable, but the effects of such combinations are not satisfactory; the effect of the nitrites at first overshadowing that of the cardiac drug, and then disappearing as the action of the latter becomes manifest. **Caffeine, Theobromine,** and **Theophillin** are all vasodilators as well as cardiac stimulants, though caffeine at first constricts the peripheral vessels by a central cerebral excitation. Theobromine has little or no central action, and may be usefully combined with digitalis in cases where vasodilatation is desired.

Huchard[3] considers that the *regular* administration of sodium salicylate in acute articular rheumatism prevents in many cases the occurrence of cardiac lesions. In cases of valvular disease where dilatation has ensued, he puts the patient to bed on a dietary of milk, and administers a purge of scammony and calomel or sulphate of soda, followed next morning by a single dose of 1 mgram of Nativelle's crystallized **Digitalin.** This dose is repeated ten days later. **Bleeding** is often of value in cases of marked venous congestion.

Broadbent[4] contrasts the cases of aortic regurgitation occurring in later life with those obtaining at an earlier period. The former group are usually due to chronic endocarditis, the result of senile degenerative changes, high arterial tension, severe intermittent muscular strain, or syphilis. Rupture of a valve is rare unless it is already more or less damaged. The pulse is generally not so shotty as it is in cases due to acute rheumatism, and the blood-pressure is usually high, for wide-spread arterial changes commonly co-exist. The disease is, as a rule, progressive, and the prognosis is in consequence grave, varying in different cases according to the degree of degenerative change which has taken place elsewhere, particularly in the kidneys and the vessels. Uræmic symptoms are not uncommon, angina pectoris or aneurysm may co-exist, and sudden death may occur with very slight premonitory symptoms. Uræmic symptoms call for mercurial purgatives, mild diuretics, and iodides, with a **Purin-free Dietary** or Huchard's *régime lacté*. Vasodilators are indicated in anginous cases, and **Morphia** is of value in both of these groups. **Digitalis** is mainly of service when the mitral valve has given way, and is less frequently useful in the chronic endocarditis cases than in those due to acute endocarditis.

Freund[5] points out that in cases of cardiac failure one can often diminish the amount of cardiac work by putting the patient in bed and administering **Codeine** if there is much restlessness, or **Morphine** if there is much dyspnœa. Of cardiac stimulants, he prefers **Digalen** given intravenously, and the ethereal tincture of **Valerian. Oxaphor** (cf. Achert, *Lancet*, June 6, 1908), **Bornyval,** and **Valydor** are also of value. **Baths** and **Massage** may also help.

Delèarde and Dubois,[6] recognizing the inconvenience of cold baths in cases of fever, recommend the continuous use of an ice-bag to the precordium. The reduction of temperature which ensues only begins after twelve to fifteen hours' application, but continues after it has once commenced.

Magnesium Sulphate produces, according to Matthews and Jackson,[7] a marked depression of the cardiac action, with a diminution in the amplitude of the systole, and a progressive slowing of the rate which ultimately leads to a complete standstill. Adrenalin and squills have no antidotal effects, but these are possessed to some extent by both **Barium** and **Calcium Chloride.** Magnesium sulphate is too dangerous to be used as an intravenous injection.

MacNider[8] has recently investigated the action of the **Nitrites** on the cardiovascular system of dogs. The arterioles and smaller veins are, as is well-known, dilated by these drugs, and the blood-pressure is lowered, while the hæmoglobin is converted into methæmoglobin and a mixture of methæmoglobin and nitric-oxide hæmoglobin. Their effect on the heart varies in dogs of different ages. In old dogs the pulse-rate is increased, the systole is lengthened, the diastole shortened, and the extent of the contractions augmented; but in young dogs there is little change in the rate or the duration of systole or diastole, while the extent of the contractions is slightly decreased. In young

dogs with normal hearts and vessels and a normal load, the cardiac work is slightly lessened, but otherwise little change occurs. In an old dog with a heart working at nearly its maximum power against a maximum load, the cardiac work is lessened, and as it approaches more nearly to its proper load, a better output is maintained and the better nutrition of the tissues is consequently ensured.

In high-pressure cases in man, the arterial pressure cannot be lowered with benefit below a variable height which the renal and arterial changes have rendered necessary. More or less sudden elevations of pressure may, however, occur from temporary vascular spasm, before which the heart sometimes fails; and in these cases the nitrites, lessening the work of the heart and increasing its power, are often of value.

James Mackenzie,[9] while recognizing fully the good effects of **Spa Treatment** in cardiac affections, is somewhat sceptical as to the value of their specific waters, whether used internally or externally. The main elements in the cure are, he thinks, the mental and physical rest entailed by absence from home, the stimulus provided by the general surroundings of the spa, and the better hygienic conditions which a "course" entails.

Selig[10] discusses the use of CO_2 baths in cardiac disease; Tiedemann and Lund[11] the value of CO_2 baths and massage; Bohr[12] the use of brine baths. The value of strophanthin given by intravenous injection is discussed by Hedinger,[13] Fraenkel and Schwartz,[14] and Liebermeister.[15]

Sudden Death.—Kisch[16] has analyzed 156 cases in which sudden death occurred. He finds that it is uncommon before the age of thirty and most frequent between fifty and sixty; that it occurs very often in fat persons with general arteriosclerosis, and in patients with fatty dilated hearts, and mitral or aortic insufficiency; while it is not uncommon in aortic aneurysm, in cases with irregular or infrequent pulses, in anginous patients who are fat, and in emphysematous patients suffering from cardiac weakness. The immediate causes of death are over-exertion, over-eating, alcoholic excess, coitus, coughing, colic, straining at stool.

Cardiac Syphilis.—Huchard and Fiessinger[17] report a case of gumma of the heart, and review the cases of cardiac syphilis described since 1900. Syphilitic lesions are rarely confined to the heart, and the arteries, kidneys, endocardium, and brain are often also affected, and the extracardiac lesions frequently cause death without the myocardial lesion being suspected. Death may ensue from cardiac failure—suddenly, without antecedent symptoms, or with acute or chronic cardiac failure—and a diagnosis is rarely possible. Myocardial failure without evident cause in a syphilitic patient should, however, attract attention to the possibility that a syphilitic lesion is present, and energetic specific treatment may in such cases lead to even complete recovery. Huchard himself has had three successful cases, and others have been reported. The authors recommend the administration of **Potassium Iodide** in large doses, reinforced by

injections of **Grey Oil**, if the kidneys are intact. All the usual treatment of myocardial weakness must, of course, be also utilized.

Herzog[18] discusses the early diagnosis of aortic and cardiac syphilis, and reports six cases. Syphilitic disease should be suspected when symptoms arise without evident cause in young syphilitic patients.

The Hereditary tendency to Aortic and Cardiac disease is discussed by Galli,[19] Klotz,[20] and Landouzy and Troisier.[21]

The Reserve Power of the Heart.—It is extremely difficult to estimate the reserve power of the heart, more especially in cases where symptoms suggestive of cardiac weakness exist, while no direct evidence of cardiac insufficiency can be found. Cabot and Bruce[22] have investigated the tests which have recently been proposed for this purpose. Their results show that Schapiro's test is of value. Normally the pulse-rate is lessened by seven to fifteen beats per minute when the patient lies down after standing up. In cases where cardiac weakness is apparent the recumbent position is not accompanied by any diminution of the pulse-rate. Herz has pointed out that in cases of cardiac weakness the pulse-rate is usually slowed when the patient sits down and slowly flexes and extends the forearm, while in normal cases it remains unaltered. The authors agree on the whole with Herz's results, but have not found them invariably accurate. Levy found that experimentally the blood-pressure is raised by occlusion of the aorta, and states that digital compression of the femoral artery in man is associated with a rise of 5 to 15 mm. Hg. in two or three minutes. If the heart is hypertrophied the elevation is greater, but if weakened no variation occurs. Cabot and Bruce say that the test is too painful to be of any value.[23] They accept Gräupner's test as on the whole accurate. After moderate exercise the pulse-rate at first rises and then rapidly falls to normal. The systolic blood-pressure begins normally to rise after the pulse-rate has fallen, reaches its maximum some minutes later, and gradually falls to or below the normal. In weakened hearts the reaction still occurs, but is delayed and perhaps diminished in degree. In serious weakness the reaction may be absent, the blood-pressure declining from the start and only gradually reascending. Gräupner used a weight-and-pulley ergometer, but these authors found a measured amount of stair-climbing satisfactory, the amount of work performed being measured in foot-pounds, i.e., the weight of the individual multiplied by the height ascended (*Figs.* 56, 57, 58).

Rheumatism and Heart Disease.—Carey Coombs[24] draws attention to the wide distribution of the rheumatic lesions in the hearts of children, the endocardium, pericardium, myocardium, and coronary arteries being often all affected at the same time. The gravity in the acute stages mainly depends on the myocardial lesion, which is shown clinically by the signs of cardiac dilatation. The valvular lesions in acute cases are rarely extensive and are relatively slight. Aortic valvular lesions, though less common than mitral, are by no means rare. In another paper[25] he describes the lesions which he has found in the myocardium, lesions which he considers to be characteristic

of the rheumatic as opposed to other forms of myocarditis. Poynton[26] has analyzed fifty-two cases of acute rheumatism which he has observed in children under five years of age, figures which show that the disease is by no means rare even at this time of life. Cardiac lesions were

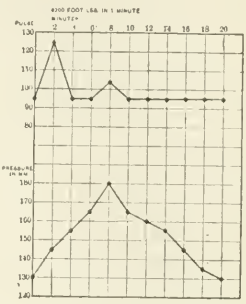

Fig. 56.—This chart (which in Cabot and Bruce's experiments represents the commonest type of normal reaction, or "*Erholung*" after exertion), shows a sudden rise in the pulse-rate from 95 to 125 immediately following 6200 foot-pounds of work, accomplished in one minute by stair-climbing. Four minutes after the performance of this work, when the pulse-rate had fallen again to normal, the blood-pressure had *risen* to 155, *or* 10 *mm. of mercury higher than it was when the pulse was most accelerated.* At the end of six minutes the pulse was still normal, but the blood-pressure had risen to 165. At the end of eight minutes the blood-pressure, continuing its rise, had reached 180 mm. After this a gradual fall in blood-pressure occurred, the normal being reached only at the end of twenty minutes, although the pulse-rate was normal in four minutes. Normal. Aged 24.

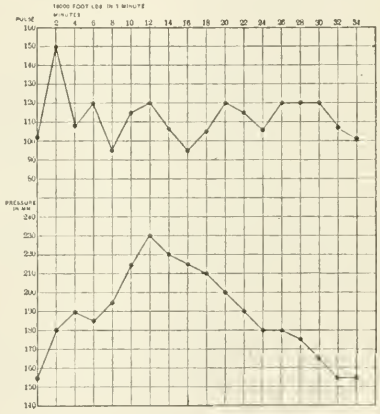

Fig. 57.—Chart showing the pulse and blood-pressure curves from a case of weakened heart in a woman. It will be noted that the "Erholung" is here *retarded*, so that the highest blood-pressure is not reached until the end of ten minutes, while the return to normal occupies thirty-four minutes in all. Myocarditis. Aged 42.

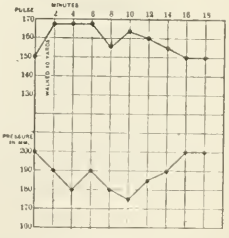

Fig. 58.—Chart showing the results obtained in a case of ruptured compensation, the patient being too ill to climb any stairs, markedly dropsical and cyanotic. Blood-pressure *fell from the start* (simultaneously with a rise in pulse) and took eighteen minutes of perfect rest to bring it back to the (very high) point indicated at the beginning of the experiment. Myocardial weakness, cyanosis, etc. Aged 48.

present in forty-three cases, and eight of the children died. Acute rheumatism occurs more frequently after four years of age, and often succeeds an attack of scarlatina.[27]

The Myogenic Theory.—The cause of the heart beat is apparently still undecided, though it is more than twenty years since Gaskell's

researches seemed definitely to overthrow the theory of a nervous origin. G. A. Gibson[28] discusses the whole question in his Oration before the Medical Society of London, and sums up strongly against the myogenic theory.

The introduction of graphic methods of investigation in disturbances of the cardiac functions has led to the appearance of numerous papers on this subject during the past year. Many of the points discussed are as yet only of theoretical importance, but some at any rate have a distinct practical bearing.

New waves have been described in tracings of the venous pulse by Piersol[29] and A. G. Gibson ;[30] a third cardiac sound has been recorded in some cases by Einthoven[31] by means of his string galvanometer ; and the size of the heart has been accurately observed by Moritz,[32] Galli,[33] and Dietlen[34] with the orthodiagraph. Bard[35] discusses the meaning of abnormal cardiac sounds, and both he[36] and Robinson[37] pay attention to the galop rhythm. In another paper Bard[38] points out peculiarities in the venous pulse which he considers characteristic of the enlarged left heart of chronic renal disease and of aortic regurgitation.

Disturbances of Conduction.—Some further post-mortem examinations in cases of Stokes-Adams' disease have been recorded. In Jellick and Cooper's case[39] there was an anæmic necrosis of the interventricular septum in the region of the *a.-v.* bundle, the result of a generalized gonorrhœal infection. In Springthorpe's[40] and Vasquez' [41] cases there was well-marked syphilitic disease of the *a.-v.* bundle. In Beeson's case[42] the *a.-v.* bundle was involved in a fibroid patch ; in A. G. Gibson's case[43] it was infiltrated with fat and the central fibrous body was hypertrophied. In Karchner and Schaffner's case[44] it was thinner than normal and contained an excess of connective tissue. It seems probable, however, that other causes may produce the same clinical syndrome. Lépine[45] has recorded the case of a woman aged 65 with a pulse-rate of 40–44, who suffered from cerebral attacks with loss of consciousness. Radiographic observations failed to reveal any asynchronism of the auricular and the ventricular contractions. Cardarelli[46] in 1907 showed a patient in whom the symptoms could be produced by pressure over the vagus nerve. After the administration of atropine they could not be induced, evidence he considered in favour of a neurogenic origin of the attacks. In one of Gibson and Ritchie's cases of heart-block[47] the conductivity of the *a.-v.* bundle was considerably improved by the administration of atropine, so that although there was probably structural change in the bundle the vagal influence was still considerable. Vaquez[48] has utilized the atropine test to differentiate between myocardial and nervous bradycardia, as he considers that increased frequency of cardiac action, after the administration of 1 mgram of sulphate of atropine, indicates a nervous origin of the condition. Fontana[49] thinks that some cases may be due to a developmental arrest of the *a.-v.* bundle, by which it retains its embryonic function, responding to stimuli by a slow, persistent contraction, a " Thomsen's

disease of the heart." Joachim[50] describes a case in which a temporary and irregularly occurring delay in conduction obtained in a boy, aged 14, suffering from mitral disease. Psychical excitement seemed probably causal.

Erlanger[51] thinks that certain disturbances of the cardiac rhythm may be produced by defective conduction at the sino-auricular junction, the line of tissue joining the remains of the primitive sinus—the musculature of the vena cava and coronary sinus—with the auricle. His experiments on rabbits showed that interference with this part of the heart produced at first cessation of auriculo-ventricular action, followed after a variable pause by contractions with a rhythm of their own. If the trauma was incomplete the distal heart might respond with a 1–3, 1–2 rhythm, exactly as happens in auriculo-ventricular block. He defines partial sino-auricular block as "the occurrence of heart cycles whose durations are simple multiples of that of the normal heart cycle." Graphic records of impaired conductivity at the sino-auricular junction have been recorded by Gibson and Ritchie,[52] Wenckebach,[53] and Hering.[54]

Extrasystoles.—Hering considers that extrasystoles are due to hyperexcitability of the cardiac muscle, and that there is no proof of a nervous origin. Ortner[55] has published the records of two cases which, he considers, show a vagal origin, as *a.-v.* extrasystoles disappeared after the administration of atropine, which would not have occurred if they had been of myogenic origin.

Mackenzie's[56] and Ritchie's[57] papers on the differentiation of the varieties of extrasystole are extremely interesting, and are illustrated by many excellent tracings. Rautenberg[58] makes a contribution to the origin of extrasystoles, and Norris[59] has written a useful review of the chief varieties of cardiac irregularity.

Disturbances of Contractility.—The pulsus alternans is usually considered to be the result of lowered contractility, and a sharp distinction is drawn between it and the pulsus bigeminus, which is the result of extrasystoles. Hering's experiments and observations[60] have led him to believe that the small contractions represent a *partial* asystole, the failure of a portion of the ventricular muscle to respond to the normal stimulus. Further failure may lead to more complete asystole and eventually to complete systolic intermission. Tabora,[61] however, has observed a case in which he maintains that a bigeminal beat could be converted into an alternating one by slight physical exertion, so that the distinction is not accurate. He thinks, too, that he has recorded alternation of the auricular as well as of the ventricular beat.

Paroxysmal Tachycardia.—Schmoll[62] describes nine cases of paroxysmal tachycardia, in two of which he was able to obtain polygraph tracings. In one of these the normal *a.c.v.* rhythm persisted, but in the second the *a.* wave coincided with *c.* He considers that the condition can be explained by Mackenzie's theory of *a.-v.* extrasystoles. His tracings, however, are not convincing. Crespin[63] describes a case

occurring in a patient already the subject of a mild form of Graves' disease during an attack of erysipelas. Two cases are also reported by Moon.[61]

Mackenzie's "Diseases of the Heart."[65]—It is always interesting to read the matured conclusions of an experienced physician upon a subject to which he has devoted particular attention, but this volume has the additional attraction that it is based on the material obtained by those newer diagnostic methods which Dr. Mackenzie has made available for clinical use; material, too, which it seems improbable is possessed in such abundance by any other person. The arrangement of the book is somewhat unconventional, as the author considers the symptoms of cardiac disease rather than the lesions associated with them, and draws attention to the indications which they afford with regard to prognosis and treatment. But the arrangement is advantageous in that it emphasizes the well-known but so often overlooked fact that "the symptoms in a case of valvular disease are not produced by the valve lesion, but by the failure of the heart muscle to overcome the difficulty created by the damaged valve," while similar symptoms are often produced in lesions of varied nature.

The author considers in some detail the fundamental functions of the cardiac muscle and the clinical methods for their investigation, and describes the different symptoms which their default may produce. The rate of the cardiac action, heart-block, defective contractility and tonicity, are successively discussed, as well as the numerous conditions which may cause an irregular cardiac action. He devotes particular attention to the "nodal" rhythm. In rheumatic heart disease this rhythm is extremely common, and is due to the stimulus arising at the *a.v.* node instead of at the sinus, and so causing a simultaneous contraction of auricles and ventricles. Failure of compensation is often directly attributable to the inception by the heart of this abnormal rhythm, a rhythm which by its interference with the natural course of events must necessarily interfere with the proper supply of blood to the systemic vessels. He believes that its origin is due to irritation of the *a.v.* node by newly-formed connective tissue of varied origin. The pulse-rate may be little altered with, as a rule, little or no evidence of cardiac failure; or more frequent, with generally notable symptoms of distress.

Dr. Mackenzie's conclusions with regard to the action of digitalis are somewhat striking. "The condition of heart failure where it acts best is where there is dilatation of the heart with healthy muscle fibres that have been exhausted in the endeavour to overcome abnormal resistance. This effect is best seen in old rheumatic affections of the heart, but it may also be observed in other cases with a fair amount of healthy muscle. It is of very little use when the dilatation of the heart is due to degeneration of the muscle fibres . . . (or) when the heart is already in the grip of some poison, whether . . . rheumatic fever, pneumonia . . . or alcohol or arsenic."

The beneficial effect of digitalis is mainly from its influence on

tonicity, cases of cardiac failure without dilatation being little affected. Slight degrees of defective conduction and contractility may be produced by it, even when the patient's general condition is definitely improved. The rate and rhythm of the heart are but little affected, save in cases of the nodal rhythm, when its influence is usually well marked and rapid.

Acute febrile affections of the heart, valvular defects, cardiosclerosis, adhesive mediastino-pericarditis, heart disease and pregnancy, chloroform administration in cardiac disease, are considered in successive chapters.

It is impossible here to review this book in detail, but enough has perhaps been said to show the general tenour of its contents, and a reasoned criticism can hardly be offered just now, as our experience of the author's methods is necessarily limited. We do not agree with all Dr. Mackenzie's conclusions, but we can confidently assert that a new era in the prognosis and treatment of cardiac diseases has definitely commenced, and that the future advance will take place along the lines which he has so brilliantly laid down.

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HEARTBURN.

(*Vol.* 1892, p. 17)—Arsenic in small frequent doses (Liq. Arsenicalis ♏ⅈ, every ten minutes for an hour) is recommended.

HEPATITIS. (*See* DYSENTERY.)

HERNIA.

Rutherford Morison, F.R.C.S.

Fagge[1] supports Hamilton Russell's saccular theory as to the etiology of hernia. In his series of seventy-eight cases the peritoneal funicular process was complete in eight. He entirely disagrees with the statement that a scrotal hernia may be translucent. Two cases which have been sent to him as hernia where there was translucency turned out to be hydrocele. Circumcision is useless treatment for a hernia. He condemns the use of the woollen skein as being quite obsolete, and as giving the parents a false sense of security. He comments on the difficulty in getting parents to properly apply a child's truss, especially among the poorer classes. "A truss never cures a rupture, but by preventing its descent, dilatation of the neck of the sac and the secondary dragging downwards and displacement of the posterior wall of the inguinal canal, which should rightly be regarded as complications of the hernia, are avoided; again, the probability of strangulation is much diminished." A truss is useless where there is an accompanying undescended testicle. The best time for an operation is after the first dentition. He considers it is quite unnecessary to approximate the conjoint tendon to Poupart's ligament. Murray[2] believes that the saccular theory offers the only satisfactory explanation of the occurrence of all abdominal herniæ which have not a definite traumatic origin. In both infants and adults there are the same two varieties of inguinal hernia: (1) The complete sac which involves the tunica vaginalis, and (2) The incomplete sac which is entirely separate from the tunica vaginalis. He has several times operated upon adults where an inguinal hernia of the second variety had appeared for the first time and become strangulated. The sac was entirely separated from the tunica vaginalis, had a relatively long, narrow neck, and there was no extravasation of blood outside the sac, or other indication to suggest that the hernia sac had been suddenly acquired. He considers that in these cases the bowel had descended into a peritoneal diverticulum which had existed since birth. In 200 consecutive post-mortem examinations, 68 peritoneal diverticula were found in 47 bodies. The average age of these 47 persons was forty-four and a half years, 30 being males and 17 females. The youngest was seven, the oldest sixty-eight. The varieties were:—30 males: 1 Umbilical, 11 inguinal (4 double), 34 femoral (11 double). 17 females: 2 umbilical, 2 inguinal, 18 femoral (3 double).

Hamilton Russell[3] does not entirely agree with Lockwood's views on infantile hernia. Lockwood holds that the processus vaginalis is occluded only at the internal abdominal ring, and the tunica vaginalis extends from this point downwards; behind this serous sac (or cord if the sac is obliterated) descends the hernial sac; this is produced by traction of the gubernaculum testis, and this binds the fundus of the sac to the testis. On the other hand, Russell maintains that the hernial sac is a portion of the processus vaginalis, and is *not* a separate evagination of the parietal peritoneum. His reasons are: (1) That

the presence of two sacs at the same time in the inguinal canal is improbable; (2) That the upward prolongation of the tunica vaginalis is due to an accidental local adhesion of the serous membrane to the surrounding tissues during the descent of the processus vaginalis; moreover, this prolongation lies superficial to the abdominal wall muscles; (3) That sacculation of the processus vaginalis is due to the local adhesion of the serous membrane, hence the production of (*a*) properitoneal and (*b*) interstitial herniæ, also of (*c*) "hernia inguino-superficialis." Closely associated with this condition is an undescended testicle. He describes two cases of his own which he places under this third heading. In a note on an accident during the employment of taxis in strangulated hernia, he records a case where a condition simulating an infantile hernia was produced. In this case the taxis had ruptured the peritoneum of the neck of the sac, allowing the strangulated intestines to surround the hernial sac.

Operative Treatment.—Von E. Grossmann[1] considers specially inguinal and umbilical hernia, and he shows from statistics that the operative treatment of these conditions is almost without danger to the patient. For a long time the prevailing opinion was that the radical cure of hernia was a dangerous operation, and therefore it must be more so in children. But to-day there is scarcely a surgeon who would recommend the treatment of hernia by truss, unless there were some obvious contraindications of operative treatment. The technique of the operation and aseptic methods have so greatly improved that during the past twenty-five years the mortality from such operations has sunk from 25 per cent to 1 per cent and under. In France, Broca has operated on 450 cases under the age of fifteen in the last fifteen years, with only one fatal result. Campbell, of Belfast, in 305 recorded cases, 34 per cent of whom were under six months, 44 per cent under one year, 77 per cent under three years, had a mortality of 0·3 per cent. The author then discusses the advantages of operation as compared with trusses in the treatment of this condition. The disadvantages of the latter, he points out, are the great difficulties in getting a truss to fit exactly in a small child. Then there are the difficulties, especially with the lower classes, in getting the child attended to properly. A truss is only a torment to a child. It also tends to form adhesions in the sac, and causes trouble in cases where they have ultimately to be operated on, and the soiling of the truss with sweat, urine, etc., causes a troublesome eczema.

Further, there is a probability that digestive disturbances may be overlooked; these are of a very obstinate nature, diarrhœa alternating with constipation, and are all avoided and immediately cured as soon as operation is performed. He does not claim that there is nothing but operation for such cases, but he believes that where, on the application of plaster and a properly secured bandage, there does not appear to be a satisfactory result at the end of a month, operation should then be undertaken. He objects absolutely to the attempt to cure these conditions by the injection of alcohol into the

sac: it is not only a long time before a cure can result, but it is exceedingly painful and by no means certain. In operating, he uses for older children Kocher's method, and where the hernia is large and the opening wide, Bassini's, both of which have yielded excellent results. During the past three years he has done 111 operations—ninety inguinal hernia and twenty-one umbilical. In the latter class one-third of the cases were under one year, and the youngest one was three months. In the former class 35 per cent were infants. In all cases he got healing by first intention, and he has not had a death. The good results he believes due in no small degree to his method of keeping the dressing from being soiled by urine. It thus remains absolutely clean and dry. The method is described in the *Münch. med. Woch.*, 1904, No. 50. It seems to him from his experience that the operation is almost entirely free from danger, and ought to to be done in all cases where on a trial of the truss there is not a speedy and efficient result.

G. L. Chiene[5] presupposes: (1) That all oblique herniæ are due to a preformed sac; (2) That the muscular valve guarding the internal abdominal ring regains its normal action if the cause of the canal dilatation is removed; (3) That obliteration of the neck of the sac is sufficient. He makes a small oblique incision over the internal abdominal ring, divides the neck of the sac, and sutures the upper opening. He does not interfere with the redundant sac tissue. Each layer of divided muscle and fascia is sutured separately. He has done sixteen cases in the past eighteen months; all are cured so far, and there is no case of hydrocele.

A. E. Barker[6] recommends the removal of extruded omentum in ventral and umbilical herniæ rather than its reduction. Should there be adhesions, he removes the skin, the hernial sac, and adherent omentum in one piece. Where there is a large opening with weak abdominal walls, he advocates the employment of a wire filigree; after opening both sheaths of the recti this wire is laid between the anterior surface of the muscles and the overlying sheath. Where there is a small hernial opening with strong belly-wall muscles, he aims at getting a broad line of adhesion by invaginating half an inch of anterior surface of the rectus sheath, on either side of the opening, and approximating their surfaces by thread or wire sutures. He favours local or spinal analgesia in these cases.

McGavin[7] regards as quite inoperable those cases where the hernia is of huge dimensions, or where there is some diathesis, such as hæmophilia. He regards the wearing of a truss as liable to vitiate the chance of success of a subsequent operation, as the hernial coverings are thinned out, matted together, and histologically altered by the pressure. Operations are condemned which aim at strengthening the closure of the hernial gap by overlapping with tendon or muscle, also of the use of wire staples to peg down the conjoined tendon and Poupart's ligament to the pubic ramus. He considers that the introduction of a filigree of thin silver wire is most likely to result in a cure, and he

gives details how to construct this. The earlier rigid perforated metal plates and woven wire gridirons were a failure, as they proved so uncomfortable it was usually necessary to remove them by operation. The wire he uses is perfectly pliable, and does not give rise to any discomfort. For a hernia in the middle line, he opens the sheaths of both recti muscles, sutures its posterior layers together, and introduces the filigree between this and the posterior surface of the recti. He considers this method superior to Bartlett's original plan of placing the wire between the peritoneum and the sheath. In the case of an inguinal hernia the neck of the excised sac must have its edges neatly sutured together; if the neck of the sac is ligatured, a knotty mass is produced which produces discomfort from pressure of the filigree. The filigree is placed upon the deep surface of the conjoined tendon, stretching from the pubic spine internally to the internal abdominal ring externally. A radical cure is now performed by Bassini's method. Two cases out of thirteen suppurated, but this did not impair the ultimate result.

Corner,[8] writing on the treatment of gangrene in strangulated herniæ at St. Thomas's Hospital, 1901–1905, says the balance has been in favour of resection and anastomosis of the bowel whenever possible. Eighteen of such cases were operated upon, with eight recoveries. During the same period resection followed by an enterostomy was done in ten cases, only one recovering. When an anastomosis is done, care must be taken to remove bowel widely above the obstruction, i.e., to avoid the septic intestinal wall. Two cases were treated by invagination of the gangrenous or doubtful area, both patients recovering. He suggests that it may be useful at times at the place where the bowel has been "nipped," also for the patchy gangrene sometimes found at the apex of the strangulated loop.

St. Thomas's Hospital Cases, 1901–1905	Mortality
Complicated strangulated inguinal herniæ	37 per cent
,, ,, femoral ,, ...	66 ,,
,, ,, umbilical and ventral herniæ ..	80 ,,
Of 216 strangulated inguinal herniæ, gangrene was recognized in 8	3·6 ,,
Of 133 strangulated femoral herniæ, gangrene was recognized in 12	9·0 ,,
Of 46 strangulated umbilical and ventral herniæ, gangrene was found in 10	21·7 ,,

The figures support the contentions made in the previous paper in general, though not entirely in detail. The percentages for 1891–1900 were 6·1, 19·5, and 25·4 respectively.

References.—[1]*Lancet*, May 2, 1908; [2]*Brit. Med. Jour.* Nov. 16, 1907; [3]*Ibid.*; [4]*Münch. med. Woch.* May 12, 1908; [5]*Brit. Med. Jour.* Nov. 16, 1907; [6]*Pract.* Feb. 1908; [7]*Brit. Med. Jour.* Nov. 16, 1907; [8]*Lancet*, June 13, 1908.

HIP JOINT, DISEASES OF. *Priestley Leech, M.D., F.R.C.S.*

Pseudo-arthrosis.—R. Jones,[1] of Liverpool, describes an ingenious operation by which he produces a pseudo-arthrosis of the hip joint when ankylosed, in place of excising the head of the femur. He found that excision of the joint produced great shock in old people. In the type of osteo-arthritis in old people, sometimes called malum coxa senilis, characterized by considerable pain and flexion deformity, the victim is finally deprived of all comfort. Rigid confinement in bed and application of a splint removes the pain and corrects the deformity, but many patients recover with a stiff joint. Many,

Fig. 59.

Fig. 60.

Fig. 61.

Fig. 62.

Fig. 63.

Fig. 64.

however, cannot stand the strain inseparable from the attempt to correct flexion; in some, if the deformity is great, persistent vomiting is induced, in others, collapse, following abdominal pain. The operation which he has devised relieves the head of the bone from the friction and from the weight of the body. It consists in removing a slice of the great trochanter, chiselling through the neck, and screwing the separated portion of the trochanter to the proximal end of the neck, in order to avoid union of the fragments (*Figs.* 63, 64). The neck may be chiselled close to the head or at a little distance; or may be completely removed (*Figs.* 59 and 61); or where there

has been destruction from disease, additional bone may be removed (*Figs.* 60, 62).

The operation, which is not admissible in the case of children, is performed as follows: A six-inch longitudinal incision is made with the upper border of the trochanter in its centre; an incision is made across the base of the trochanter just below the insertion of the gluteal muscles; a slice of the trochanter from this point to its junction with the neck above is sawn or separated by a very wide osteotome and retracted upwards. The capsule is now opened and the head separated from the neck with an osteotome (*Fig.* 59). Extension is next put on the femur, and the trochanter, with its muscles attached, is screwed on to the head of the femur, which remains in the acetabulum (*Figs.* 61, 64). Deep and superficial sutures complete the operation. In the case of a tender joint, to avoid impinging it may be necessary to remove a portion of the neck. In the case of an ankylosed joint following sepsis, it may be advisable to divide it near the trochanter, instead of near the acetabulum. This operation saves time in cases where disarticulation would have to be made with a chisel; the femur remaining is well supplied with muscles for useful movement, and no stitching of capsule is needed for the prevention of displacement upwards.

Tuberculous Disease of Hip.—Bowlby[2] gives his experience of the treatment of 900 cases in children under twelve at the Alexandra Hospital. Of these only 33 have died, giving a mortality of less than 4 per cent. The causes of death have been as follows: Meningitis 12; local disease with visceral complications 20; intercurrent disease 1. Previously, in the years 1867 to 1879, 384 cases were treated in the same hospital with a mortality of 26 per cent. Out of the 900 cases, 266 have been treated in their own homes in London, and have been visited there by nurses and brought to the hospital from time to time. All cases have been admitted, and only two were discharged as incurable on account of extensive disease of the spine, and in these the hip disease had practically come to an end. During twenty-one years Bowlby has never treated any case by excision of the hip; they have all been treated by rest and extension, and what may be called general hygienic measures. All the children have been made to walk on crutches for at least a year after it was no longer necesssary to confine them to bed, and the rule was that no child should walk on the bad leg for at least a year after he was well enough to be up and go about on crutches. No child has been discharged who had to wear a splint. A Thomas's splint is a very useful appliance in a certain number of cases where for some reason the patient cannot be kept lying down, but it never efficiently takes the place of complete rest in the recumbent position and the application of extension. Forty of the patients had both hips affected. Tuberculous phthisis has hardly been met with—perhaps half-a-dozen cases in all,—and another curious thing is that very few of the children have had tuberculous disease of the glands of the neck.

The reasons for the good results are two: (1) Treating the child first and the disease second; and (2) Antiseptic surgery. It must not be forgotten that there is always tubercle in some other part of the body as well as in the hip joint, and the main thing is to have a robust belief in the possibility of the patient being able to cure the tubercle that is in him if he is only given sufficient help. In the treatment of any local abscesses, great care must be taken that antiseptic surgery has its fullest possible scope. Tubercle predisposes the tissues to invasion by other micro-organisms, and pyogenic organisms in their turn damage the tissues and allow them to be more easily invaded by tubercle bacilli.

With regard to the treatment followed in these cases it has been that recommended by Howard Marsh—absolute rest in the recumbent position, extension in the long axis of the limb, and splints if necessary. The child must not be allowed to sit up. Bowlby has given up the introduction of various antiseptics into the cavity of the abscess. The abscess is opened under strict antiseptic precautions, and drained for a week or two. "Do not make too many incisions; remember that if too many cellular intermuscular planes are opened up the pus will infect them, and be very careful about making counter-openings unless the abscess tracks to another place very near to the skin."

The general treatment consists of good food, very great care in the dressing of wounds, a certain amount of iron and cod-liver oil (especially in the winter), sending the patients away to the country convalescent homes, and treating them as much as possible in the open air. Of late, two large open balconies have been built at the Alexandra Hospital, and some of the worst cases are kept in these night and day, and immense improvement has followed. The treatment by tuberculin injections has not been tried in any of these cases, but in subsequent ones Bowlby has tried the injection of Koch's **New Tuberculin**, and thinks in some he has seen definite improvement from its use. He considers that excision of the hip is never required in the treatment of the disease, although he thinks excision of the knee for tubercle after early childhood is good both theoretically and practically.

Congenital Dislocation of the Hip.—Fairbank[3] says that surgeons are justified in operating in these cases, because there is a fair prospect of cure and almost certain amelioration, and the condition is a real handicap to the patient. There are two methods of treatment used at the present time—the bloodless or manipulative method, and the open method; or a combination of the two. Of the open method there are two varieties—the Hoffa-Lorenz, and the method practised by Burghard in which the joint is opened, the hour-glass contraction dilated, and the head of the femur placed in the acetabulum beneath the eye, no attempt being made to improve the shape of the bones. The Hoffa-Lorenz open operation is now generally condemned on account of the risk of ankylosis occurring. Burghard diminishes the manipulations necessary at the time the joint is opened by anæsthetizing the patient a week previously and manipulating the

limb after the method of Lorenz, and if this fails he opens the joint. Fairbank allows three weeks to elapse before opening the joint, and this seems wiser, as time is given for the bruising to pass off and the risk of sepsis is thereby diminished. After the manipulation the leg is fixed in the Lorenz or frog position, and kept there for the three weeks before the operation is done.

The dangers of the Lorenz operation must not be forgotten, but with care they should be avoided. Lorenz, in 1905, published the following accidents in 450 cases: Fracture of the femur, 11 cases; fracture of the pelvis, 3; peroneal paralysis, 3; crural paralysis, 5; sciatic paralysis, 3; rupture of the femoral artery, 1; and gangrene 1; he also had some deaths from the anæsthetic. Fairbank lost two cases in a series of 48 operations; one was fracture of the femur, and the other accident was suppuration of the hæmatoma resulting from laceration of the muscles in the front and to the inner side of the joint.

The after-treatment is most essential. The chief point is that the plaster should be retained for a sufficient length of time. It is well to warn the parents that the leg may take several months to come down to its normal position, and until this has occurred the walk is not likely to be good.

Abbot[1] reports thirty-one cases of congenital dislocation of the hip joint reduced by manipulation; two were bilateral; twenty-two, or 66 per cent, normal; nine, or 27 per cent, anterior position; two, or 6 per cent, complete failures. Most of the anterior dislocations and failures occurred in the earlier cases.

REFERENCES.—[1]*Brit. Med. Jour.* Feb. 29, 1908; [2]*Ibid.* June 20, 1908; [3]*Lancet*, June 20, 1908; [4]*Med. Rec.* May 23, 1908.

HYMEN, IMPERFORATE.

(Herman, *Diseases of Women*)—With the patient in the lithotomy position under a general anæsthetic, cleanse the surface of the septum with an antiseptic solution and "incise" it with the **Paquelin Cautery.** Do not wash out the vagina. Allow the retained blood to flow out, then apply cotton-wool pads, frequently changed, to the vulva.

HYPERIDROSIS. *E. Graham Little, M.D., F.R.C.P.*

Viela[1] states that the following method has been adopted by the military hospitals in cases of plantar hyperidrosis. The first day the plantar surface is painted over by means of a wool plug with 1–3 solution of commercial **Formol** three times—morning, noon, and evening. On the second day three similar applications of 1–2 solution are made. On the third day the undiluted solution is thrice applied. Thereafter, one application a week of the undiluted solution is ordered. If the epidermis is tender or broken, the treatment should be commenced with weaker solutions—1–10 to 1–30. This treatment appears to harden the epidermis, as well as to deodorize and disinfect the parts. It has a slightly deadening effect on the sense of touch, and should be used with caution in the case of hyperidrosis of the hands.

REFERENCE.—[1]*Arch. de Méd. Militaire*, in *Pract.* Aug. 1908.

HYPOPYON. (*See* CORNEA, DISEASES OF.)

HYSTERIA. *Purves Stewart, M.D.*

Special attention of recent years has been directed to psychical methods of treatment, and yet it is a truism to state that psychotherapeutics have been practised, consciously or unconsciously, not only by physicians but also by priests and by charlatans, ever since medicine was an art. Every medical practitioner exercises a psychical influence for good or for ill upon the patients with whom he is brought in contact. It is therefore of value to consider, in the treatment of diseases, to what extent suggestion may be legitimately employed, whether by itself or as an adjuvant to other remedial measures. The cases *par excellence* in which psychotherapeutics attain their most brilliant results are those of hysteria, and less markedly in the other neuroses, as psychasthenia and neurasthenia. The cures effected by "faith-healing," by so-called "Christian science," by pilgrimages to various shrines or magicians, whether Christian or pagan, are all examples of cure by suggestion. Affections such as infective fevers, new growths, toxic disorders, traumatisms, and the various structural diseases are, of course, beyond the curative influence of psychotherapeutics, except in so far as a belief in his ultimate recovery may affect favourably, for a time at least, a patient's general spirits and nutrition, increasing his appetite, improving his powers of sleep, etc. But although suggestion has been employed indiscriminately by the charlatan (combined usually with some cheap and innocuous drug, sold at an exorbitant price) as a panacea for all and sundry maladies, functional or organic, this is no reason why, in selected cases, educated physicians should not employ it in a right and proper manner.

Hysteria is a condition which shades imperceptibly into normal mental states, there being no hard and fast boundary. Normal individuals possess a certain susceptibility to suggestion and a certain emotional reaction, in widely varying degrees. Such reactions are specially lively in children, so that we may with Schnyder[1] speak of the "physiological hysteria" of childhood. But if an adult reverts to a childish susceptibility to suggestion, or to infantile emotional reactions, we consider him or her pathological and hysterical. The outstanding features of hysteria are deficient inhibition and undue reaction to stimuli, whether these arise in the outside world or are produced from within—so-called auto-suggestions. Among the most striking instances of this are the phenomena of hypnotic suggestion, whereby a peculiar form of hysteria, the hypnotic trance, is artificially induced by suggestion, and can be made to disappear suddenly by the same means. Such disappearance of symptoms during or after hypnosis is sometimes employed as a therapeutic measure, but it is open to the objection that it does not strengthen the patient's inhibition, but utilizes the fault. Therefore treatment of hysteria by **Hypnotic Suggestion** is less beneficial than suggestion in the waking state, whereby we fortify the patient's will-power and

enable him or her to throw off the morbid ideas, instead of covering them up by other artificially-induced hysterical states. Another feature of hysteria is its tendency to introspection ; the hysterical patient takes little or no interest in anything except her own symptoms ; she has a morbid craving for sympathy, and likes to be considered the suffering heroine of the drama.

How are we to treat such patients ? Suggestion (quite apart from hypnotic suggestion) is a most powerful remedy. Sometimes we make the **Direct Suggestion** to the patient that he is improving or that he will certainly get well. Such a suggestion, of course, must never be made until we have satisfied ourselves, by a thorough and exhaustive examination, of the absence of organic disease. Direct suggestion is most efficacious when it is made with quiet confidence, in moderate and temperate language. Unduly dramatic emphasis or unnecessary exaggeration may fail in cases where a temperate and moderately expressed confidence would have had a profound effect. Tact and experience on the part of the physician are necessary in order to gauge the extent to which direct suggestion may properly be employed. The patients with whom we may venture to be most dogmatic are children and those who are mentally immature or ignorant. Highly cultured patients resent any suspicion that they are being " bluffed " out of their illness.

One of the main difficulties in the treatment of major hysterical symptoms, such as the various paralyses and the different forms of hysterical spasm, is that of discovering the underlying auto-suggestion in the patient's mind which is at the root of her outstanding symptom. And thus it is that the method of **Psycho-analysis,** as elaborated by Breuer, Freud, Jung and others, has proved of some value. These observers claimed that if they were successful in awakening in the patient the memory of the original event in her past life which was the exciting cause of her hysterical symptoms, and if, in addition, the patient gave the fullest description of that event and of the emotion to which it gave rise, the result was that the hysterical symptoms immediately and permanently disappeared. When the patient had, so to speak, purged her mind of the original incident, she at once recovered. It is well-known in ordinary life how the unloading of the mind, by confiding some real or fancied cause of worry to a friend, has a remarkably soothing effect even in normal persons, producing a sense of comfort and relief. With hysterical patients the process is somewhat more difficult to achieve, but the following is a short account of **Freud's Method of Mental Catharsis,**[2] whereby the pent-up emotion is dislodged. It will be observed that, when properly carried out, suggestion plays no part in it.

The patient lies extended on her back on a couch, whilst the physician sits behind her on a chair, out of her field of vision. The patient is not asked to close the eyes ; on the contrary, the séance is a conversation between two individuals who are both fully awake. The patient, however, is spared every muscular effort and every

diverting sensory stimulus which might disturb her in the process of mental concentration. The physician now asks the patient to try and remember the earliest incidents of her illness and the circumstances under which these incidents arose. Before she starts on her narrative it is impressed on her that she must relate everything that comes into her head, whether important or unimportant, whether relevant or otherwise. She is specially asked not to suppress any idea because it happens to be shameful or disagreeable. Histories thus elicited show at the outset marked lacunæ or lapses of memory. The patient is urged to fill up these lapses by an increased effort of attention, and it is found that if the lost incident is recalled, she usually experiences a marked sense of discomfort. Freud concludes that the lapses or lacunæ of memory are the result of a mental process which he terms suppression (*Verdrängung*). As a motive for this suppression, he recognizes feelings of aversion or dislike, resistance being offered to the memory-reproduction. The occurrence of such resistance is one of the fundamental principles of Freud's theory. The thoughts which are ultimately brought out by the process of mental catharsis he regards as derived from suppressed psychic images, transformations of them, the result of the resistance offered to their reproduction. The greater the resistance, the more marked is this transformation. Freud's method renders accessible to consciousness subconscious factors previously undiscovered by the patient or physician. Freud also claims that a study of the hysterical patient's dreams often affords a clue to his subconscious motives. To sum up, the object of Freud's psycho-analysis is to remove the gaps of memory and to clear up all doubtful occurrences of the patient's psychic history, making subconscious factors accessible to consciousness. The method, however, he admits, is laborious and slow. He states that for successful treatment of a severe case, from one to three years may be necessary. Young subjects are more hopeful for treatment than old ones, inasmuch as by the time a patient has reached the age, say, of 50, the mass of accumulated psychic experiences is so vast that it can no longer be embraced, and it is impossible to reproduce old-standing memories of youth or childhood.

All this is interesting as a psychical study, but it is somewhat doubtful whether psycho-analysis will ever attain a really important place in psychotherapeutics. Firstly, it is a slow and tedious process at the best, each séance requiring an hour or more, and numerous séances being required. A second and more important objection, as Dercum has pointed out, is that Freud's method entails cross-examination of patients on long-forgotten incidents of their sexual lives. Freud believes that most obsessions and hysterical spasms can be traced to some sexual incident in early life, and that the patient suppresses the memory of reproaches whose origin is sexual, and evolves the obsession or spasm instead. Dercum, however, holds that the importance of sexual factors has been over-estimated by Freud, and that it is not unlikely that his method in some cases

actually suggests the memories of sexual occurrences. Be this as it may, persistent and insistent questioning on sexual subjects must be unpleasant and revolting to the feelings both of the physician and of the patient, and for this reason, if for no other, the method is not likely to be widely practised.

REFERENCES.—[1]*Jour. de Neurol.* 1907, p. 281; [2]Dercum, *Ther. Gaz.* May 15, 1908.

ICHTHYOSIS.

(*Vol.* 1908, p. 318)—Jamieson obtained real improvement by scrubbing the body with **Salicylic Acid** and **Superfatted Soap**, afterwards anointing it with a **Resorcin** preparation, such as Resorcin ℥ss, Lanolin ℥iss, Ol. Amygdalæ ℥ss or Resorcin ℥j, Glycerin of Starch ℥j. The scalp was washed at intervals with yolk of egg and warm water, or with quillaia infusion. **Cod-liver Oil** was given internally in small doses.

ILEUS. *Rutherford Morison, F.R.C.S.*

C. A. Ewald[1] says that often before vomiting or eructations have occurred, the introduction of a stomach-tube may show that the stomach contains fæculent matter. It is astonishing how early in cases of ileus the stomach contents become dirty, and how quickly after washing out it refills. He had frequently, by washing out a large quantity of fæculent stomach contents, demonstrated the serious condition of a patient who otherwise did not appear to be very ill.

REFERENCE.—[1]*Berl. klin. Woch.* Nov. 4, 1907.

IMPETIGO CONTAGIOSA.

(*Vol.* 1908, p. 319)—Carrière recommends a **Borated Potato Starch Poultice** to remove crusts, followed by the application of gauze soaked in 10-volume **Hydrogen Peroxide**, covered with rubber, and changed every twenty-four hours. Calomel in small doses assists the cure. Whitfield recommends that the scabs be soaked off with **Kerosene Oil**; the area is then to be dressed with hot antiseptics (Hydrarg. Perchlorid. 1–4000) or with an ointment consisting of Ammoniated Mercury gr. xx to Ung. Paraffini ℥j.

INFANT FEEDING. (*See also* MARASMUS.)

Prof. G. F. Still, M.D., F.R.C.P.

Armstrong[1] repeats the time-worn but very necessary reminder that there is no real substitute for the mother's milk. He thinks that when the doctor is first consulted about the feeding of a baby who is at the breast, it is best to avoid even the mention of the possibility of weaning, for fear that his words may be twisted into an excuse for stopping the breast-feeding. Too prolonged intervals of suckling may be as bad in result as too frequent feeding, though in a different way: the long intervals render the milk too watery. Hasty suckling may be the fault; each feed should take fifteen to twenty minutes. If weaning is necessary, Armstrong regards a percentage prescription for a cow's-milk mixture as the most scientific mode of feeding, and the one which in time to come will be employed whenever possible; but the simpler method of diluting milk is, he thinks, all that is necessary in most cases. Starting with milk 1 tablespoonful, water 2 tablespoonfuls, in the first week, he gives milk 3½, water 3 tablespoonfuls, at three months; milk 9 tablespoonfuls, water 3 tablespoonfuls, at

six months; and milk 12 tablespoonfuls, water 3 tablespoonfuls, at nine months. By this method a total quantity of 72 oz. is taken in the twenty-four hours at nine months: the child is fed six times daily at intervals of three hours during the day-time. A little vomiting, or "posseting," should not mislead into altering the proportions of milk and water without first appealing to the weighing-machine; if the child is putting on weight, there is no need to worry about the slight vomiting.

Excessive Dilution of milk is a common cause of wasting; sometimes an infant is getting only 12 oz. of milk a day when he should be getting 20 or 30: and the residue of the food is simply water. Where there is a little tendency to vomit, and some curd in the stools, small doses of hydrarg. c. creta given thus: Hydrarg. c. creta gr. $\frac{1}{4}$, pulv. rhei gr. $\frac{1}{4}$, sod. bicarb. gr. $\frac{1}{4}$, ter die, is sometimes useful. In more acute cases it may be necessary to reduce the feeding, and give bismuth carb. gr. 3, calomel gr. $\frac{1}{20}$, every four hours.

If the child, though taking food well, does not gain weight, Armstrong recommends a teaspoonful of **Lemon** or **Orange Juice** once a day. If the baby tires of its feeds of plain milk and water, a teaspoonful of Mellin's food may be added to one or two of the feeds daily. Barley-water has little, if any, advantage over plain water as a diluent: it should be made twice a day, as it goes sour even more quickly than milk.

Cream and whey mixtures, though theoretically preferable to plain milk and water, are difficult to prepare satisfactorily without a laboratory; but they may be used in cases where milk and water cannot be digested.

Prentiss[2] considers it advisable to keep the proteid percentage as high as possible in an infant's food, and to secure its digestion by adding **Sodium Citrate** to the milk mixture. For infants at the breast, 2 to 4 gr. in one to two dessertspoonfuls of water just before each feed is advised. The advantages claimed for it are: (1) It renders the curd of cow's milk more digestible; (2) It is cheap; (3) It is convenient to handle, easy to control, and progressive in principle; (4) It allows the milk to be given in a more concentrated form, and thus avoids to some extent the danger of underfeeding; (5) There is no danger of scurvy; (6) Given as a medicine it gains the confidence of the mother; (7) The taste is not unpleasant. It is, however, of no value in the rare cases of complete intolerance of cow's milk, nor in cases where there is gastro-intestinal irritation from impurity of the milk. Prentiss finds constipation an uncommon result from sodium citrate, and mentions Cotton's view that the constipation is due to low percentage of fat in the food; and, moreover, states that in the adult sodium citrate acts as a laxative. Urination is said to be increased by this drug. For the constipation produced by sodium citrate, Vanderslice recommends 1 dr. of olive oil at night. It is a fact of practical importance that infants often show a peculiar idiosyncrasy in the digestion, or rather indigestion, of particular elements of food: one cannot digest proteid, another starch or sugar, another fat.

Chapin[3] points out that *proteid incapacity* does not always mean inability to digest proteids of all sorts; the difficulty may be only with the casein of cow's milk; and it often happens that if some other proteid is given the infant digests it well, and begins to thrive. Infants cannot thrive without proteids, and if they have real proteid incapacity they will soon die of inanition. It should always be remembered that proteid does not mean a simple substance, as does fat or carbohydrate, but a series of highly complex bodies, which differ in form, taste, composition, and nutritive value. It is possible that many of the poor results in infant feeding are due to the exclusive use of proteids deficient in iron and phosphorus. The use of a vegetable proteid rich in iron (oat or legumen) might thus be of value.

Kerley,[4] describing *Carbohydrate-incapacity* in infants and children, says that the most usual manifestation of sugar-excess, or sugar-incapacity, is regurgitation between the feedings, and this is specially apt to happen if cane-sugar is used. Maltose may produce the symptoms, but in less degree. The capacity for milk-sugar is greater than for maltose or cane-sugar; it is assimilated with less disturbance than the other sugars, and may be given in larger amounts. It will thus serve a better purpose as a food in supplying a greater amount of energy and heat-producing material. Cane-sugar, on account of its sweetness and difficulty of digestion, can be taken ordinarily in but half the amount of milk-sugar. Vomiting and regurgitation attributed to fat incapacity will often be found to be dependent upon sugar excess. The claim that milk-sugar might produce alimentary glycosuria in infants is not without foundation. Maltose incapacity is evidenced by regurgitation and vomiting, and through its laxative properties. A useful field for this form of sugar is to supply carbohydrate to the constipated infant. The systemic manifestations of sugar-incapacity in infants are few. Irritability, scalding urine, and eczema are the most frequent signs of intolerance or excess.

As to *Starch*, there is no age limit for its use if cooked. Starch indigestion is supposed to manifest itself through a distention of the abdomen by reason of fermentation of starch in the intestine. This may take place, but it is not a reliable sign. The stools of starch-fed children present practically the same gross appearance, whether they contain free starch or not. If starch is not digested it does little harm. The removal of starch from the food in children with distended abdomens produced but little effect on the tympanites, in most cases the distention was due to other causes. The chief harm from starch-feeding is constipation, which sometimes follows its use; and this may be prevented by adding some dextrinizing agent which converts the starch into a laxative maltose. It is rarely wise to use starch in higher proportion than 3 per cent for children under one year. Cane-sugar capacity in older children varies much. The so-called lithæmic children are all "sugar susceptibles," and one manifestation of sugar poisoning is a persistent hyperæmia of the mucous membrane of the upper respiratory tract.

Fat-incapacity, according to Howland,[5] is decidedly the most disturbing element in infant-feeding; the symptoms are gastric, intestinal, and constitutional. An increase of fat in the food beyond certain limits causes a great increase of the ammonia-nitrogen in the urine, a fact correlated with loss of fixed alkali from the body, and so with a reduction of alkalinity—in other words a relative acid intoxication. Any acid intoxication means that the fixed alkalies ordinarily available to neutralize the acids formed in metabolism were insufficient for this purpose. The ammonia required must come either from proteid circulating in the blood, or from that already built into an integral part of the body tissues; in the former case the body was being deprived of materials for building; in the latter, part of the already-built structure was being wrecked. Acid intoxication interfered with the most important functions of the body, and if this were the only result of excess of fat inan infant's food, it would prove the danger of this fault. But though excess of fat is dangerous, there is no doubt, as Lovett Morse pointed out, that deficiency of fat is also a serious fault, and most infants will do well on 3 to 4 per cent of fat; it is the proportion of 6 or 8 per cent that does mischief.

"*Bacillus bulgaricus*" has well-defined bacteriological and definite parasitic inhibitory properties, and, moreover, has an easily assimilable curd. Howland's indictment of buttermilk is in amusing contrast to the eulogium bestowed on it by many observers, especially in Germany. He says it has the following shortcomings: (1) Commercial buttermilk contains little or no fat; (2) It varies in the amount of its component elements on account of an equally variable degree of dilution; (3) It presents a food teeming with extraneous germs of filth or disease; (4) It is impossible to procure at stated intervals in required amounts; (5) It is an inexact, unhygienic base even for temporary milk-substitution. The one specially valuable property in buttermilk is its lactic acid; and now it is possible to produce this in milk with much more exactness and cleanliness. Lactic acid bacilli have been stated to reduce intestinal putrefaction due to *Bacillus coli* or *Bacillus proteus*. The good results of ingestion of lactic acid bacilli were found to last seven weeks after administration, as judged by diminished intestinal putrefaction. Pochon showed that indol and phenol substances in the urine were diminished. The *Bacillus bulgaricus* inhibits the growth of typhoid bacilli in dextrose broth. A further advantage of this acidified milk is that the digestive enzymes of natural milk are not killed, as in the unnatural processes of sterilization or pasteurization, but are augmented.

Buttermilk has for many years been advocated for the feeding of infants, especially of infants with gastro-intestinal disorders and marasmus. Carpenter,[6] of Philadelphia, says that buttermilk contains ·5 to 1·5 per cent of fat, and from 2 to 3 per cent of proteid. The calcium casein of ordinary milk is changed to casein lactate during the preparation of buttermilk. Infants take it readily; and it has no unpleasant effects, except that in some cases it causes vomiting during

the first one or two days. The proteids are said to be in particularly digestible form. Several infants who were unable to digest ·75 per cent of calcium casein were able to digest the 2 to 3 per cent of casein lactate in buttermilk. It is prepared thus: A pint of fresh milk is allowed to stand for twenty-four hours in a jug covered with a cloth at a temperature of 65° to 70° F. The cream is then skimmed off, and the sour milk is churned for fifteen minutes in a glass churn of the capacity of one quart. It is then placed on ice, and is fit for administration during the next twenty-four hours. A quart of this buttermilk is added with constant stirring to one teaspoonful of wheaten flour and four tablespoonfuls of granulated sugar. The food is then heated just to the boiling point in a double saucepan with constant stirring, care being taken not to curdle it by excessive boiling. It is cooled rapidly, and kept in bottles ready for use.

Very closely allied to buttermilk is the **Acidified Milk,** or as the Americans have named it, *Lactacid Milk*, which has recently become fashionable both for adults and for infants. Carter[7] says that buttermilk is unsatisfactory, as there is no certainty as to its bacterial contents, but lactacid milk, which has been artificially impregnated with *Bacillus bulgaricus* (obtained from Bulgarian sour milk), has a much more definite composition: it is free from the yeasts which are often present in buttermilk. He considers that milk artificially acidified has the great advantage over sterilized and pasteurized milk that the digestive enzymes of the milk, so far from being killed, are actually increased. The use of acidified milk is indicated, according to him, in cases of curd-indigestion, in fermentative diarrhœas, and in specific infections of the intestine with typhoid or tubercle bacilli.

References.—[1]*Med. Press*, Feb. 5, 1908; [2]*Ther. Gaz.* Dec. 15, 1907; [3]*Med. Rec.* Dec. 14, 1907; [4]*Ibid.*; [5]*Ibid.*; [6]*Lancet*, Oct. 5, 1907; [7]*N. Y. Med. Jour.* Ap. 4, 1908.

INFLUENZA, CEREBRAL. *Robt. Hutchison, M.D.*

Symptoms.—Saundby, in an address on this subject,[1] after describing several cases, summarizes the symptoms as follows: Usually after a short period, ranging from one to four days, during which the patient shows signs only of catarrh—and in some cases even this history may be wanting—he is seized with intense headache, with or without vomiting, or neuralgia, or an epileptic or apoplectic fit or aphasia, or there may be facial paralysis, monoplegia or hemiplegia, for the cerebral symptoms may be ushered in by any one of these symptoms. There may be a preliminary period of restlessness, with or without delirium; in others stupor or unconsciousness develops gradually or suddenly. There is usually fever, varying in amount. The muscles are often rigid; stiffness of the neck, opisthotonus, and especially contraction of the masseters and trismus, have been frequently noted; there may be twitchings of the limbs or clonic spasms of the head or extremities, disturbances of vision, inequality or irregularity of the pupils, paralysis of the sphincters, and *tache cérébrale*. The reflexes are generally preserved, and there has been no mention of the presence of Kernig's

sign. Optic neuritis is occasionally seen: albuminuria has been generally absent, but was observed once or twice; Cheyne-Stokes breathing has been noted in a few cases.

The Prognosis should always be guarded, but is not hopeless, for the recorded cases show that neither such a syndrome as convulsions, coma, relaxed sphincters, and fever to 104° F., nor unconsciousness, hemiplegia, aphasia, and irregularity of pupils, may imply death. The gravest condition appears to be complete coma, general relaxation of the limbs, rising temperature, and Cheyne-Stokes breathing. The presence of ear mischief, old or recent, of organic disease of lungs, heart, or kidneys, of arteriosclerosis, or advanced age, should be regarded as bad features; while, on the other hand, youth, a good constitution, and sound organs may afford a basis for hope, although cases have died which had all these points in their favour. The duration of the cerebral symptoms in the fatal cases has varied from two to fourteen days; but the last was exceptional, and death has generally occurred in less than a week from the onset of the cerebral symptoms. On the other hand, the cases that have recovered have usually shown definite signs of improvement in three or four days, but convalescence has been slow.

Treatment.—If the patient can take medicine by the mouth, we should try small doses of **Quinine**, which the late Sir William Broadbent believed to be a real prophylactic of influenza; and, if a prophylactic, it should possess some therapeutic power too. We can feed the patient with milk, or egg beaten up, or with *café au lait*. If there is inability to swallow, we should try rectal feeding by small enemata of egg, milk, and a little salt, introduced slowly through a soft rubber tube passed three or four inches into the bowel; or if, as too often happens, the sphincter is relaxed, we can inject half a pint to a pint of normal saline solution under the skin and stimulate the heart by similar injections of caffeine (5 gr.) or camphorated oil. The last is much praised in France as a stimulant to the heart in collapse; the strength used is 1–10, and the dose 10 to 15 min.

Reference.—[1]*Brit. Med. Jour.* June 6, 1908.

INTESTINAL OBSTRUCTION. *Rutherford Morison, F.R.C.S.*

Chas. Elsberg[1] says that in spite of the advances that have been made in methods and technique, the mortality after operative interference in acute intestinal obstruction is still very high. With different operators, the mortality has varied between 50 and 70 per cent. Of 100 cases treated by operation during 1906, in three large hospitals of New York City, 54 per cent died. Ranzi has collected 758 cases, with a mortality of 57 per cent. Even if the advanced cases are excluded, the mortality after operations will be found to be very high —30 to 40 per cent. From a medical standpoint, this mortality can be diminished only by improvement in diagnostic methods, so that the patients can be referred to the surgeon more early; from the operative standpoint, the number of operative failures can only be

decreased by greater simplicity in operative manipulations. In a relatively small number of patients the general condition is still a very good one, so that radical operative interference is fully justified. In desperate cases, all that can be done to relieve the urgent symptoms is to open and drain the bowel.

There are a number of cases which in point of severity may be placed midway between those in desperate and those in good condition. These are usually subjected to radical operative interference. During the past two years, the writer has operated upon a number of such patients by performing an enterostomy of the most distended coils of intestine which presented when the abdomen was opened. No search was made for the cause of the obstruction, nor was any effort made for its relief—unless the obstruction was at once met with and the freeing of the bowel a very simple matter. It is now recognized that the presence of the retained intestinal contents is a very great, if not the most important, factor in the production of grave symptoms. When the significance of the poisoning from the retained intestinal contents began to be recognized, and attention was turned to the question of their rapid elimination, it was thought that the best way to rid the body of these substances was by increasing peristalsis after the obstruction has been relieved. By this treatment many patients died from rapid absorption of the toxic substances by the healthy gut below the obstruction. Later, many surgeons made it a rule to empty the distended loops of intestine of their gaseous and fluid contents by aspiration or incision, followed by suture. This is the procedure most in vogue to-day.

The writer considers that in the less grave cases in patients who still seem to be in fair condition, whose circulation is still pretty good, who are not exhausted by vomiting, the operation of opening and drainage of the bowel should be done more often, and the search for and relief of the obstruction left to a second sitting. Against the operation of enterostomy alone there is: (1) The cause of the obstruction remains unrelieved; (2) There may be a gangrenous process present, or gangrene may set in unless the obstruction is relieved; (3) After the enterostomy, a fæcal fistula will remain which may require a second operation for its closure. He reports twelve cases of acute intestinal obstruction, exclusive of strangulated hernia, that he has operated upon during the past two years; in five of these cases an enterostomy was done and the obstruction left to a second sitting; four recovered, one died. Of the remaining seven cases the condition of the patients permitted further operative measures; six recovered, one died.

REFERENCE.—[1]*Brit. Med. Jour.* May, 1908.

INTUSSUSCEPTION. (*See also* INTESTINAL OBSTRUCTION.)

Rutherford Morison, F.R.C.S.

X. Delore and R. Leriche[1] say that of 300 cases of intussusception in the child, 204 (68 per cent) occurred in children less than one year old, and of these 66 per cent have been attacked between the fourth and

seventh month. This incontestable but inexplicable fact, they say, corresponds with congenital hypothesis. In 48 per cent of fœti the cæcum is mobile in half: in consequence, in the early days of life the cæcum should have the facility of telescoping; this is not so later on. Gradually, fixation goes on, and in 85 per cent of the adult cases the first part of the large intestine is fixed in the iliac fossa. In 8·5 per cent the cæcum retains its mobility all its life, so intussusception in the adult may occur in this way. Thus the anatomical evolution of the mesentery is nearly always the cause of intussusception. This is not so in the small intestine, as it can always invaginate itself. Ileocæcal intussusception, though considered to be the most common, is not so, but rather ileocolic, the head of the intussusception being the cæcum, while the ileum has nothing important to do with it. The ileocæcal valve plays no part whatever in the proceedings; that is to say, the supposed ileocæcal intussusceptions are of the large intestine altogether. Of the author's seven cases there were two ileo-ileal intussusceptions, one ileocæcal, two cæcocolic, one ileocolic, one colocolic. Of these, two were essential invaginations (without cause), one due to Meckel's diverticulum, two intussusceptions due to simple tumours of the small intestine, one to malignant tumour of the small intestine, one to malignant tumour of the ileum. They state that essential invagination is common in children, and rare in adults. Irritation in the region of the cæcum may cause spasm, and with a suitable mesentery it will invaginate itself into the ascending colon, and may go as far as the anus, the head of the intussusception being the caput cæcum the whole way, and not the small intestine. They state that in cases of this type it is most important not to make traction on the small bowel, but on the large intestine only. Intussusception due to Meckel's diverticulum occurred in a child of six, the Meckel first becoming inverted into the bowel, then the involved ileum passed into the ileocæcum.

Treatment.—(1) Disintussusception should be first attempted; if without success, no force should be used. Having reduced intussusception, next look for a cause and remove it. When in the cæcal region, the cæcum should be moored down in the iliac fossa in some way. (2) Total removal of the disintussuscepted portion. (3) Extraction of the swelling after incision of the sheath. This latter method they have adopted twice, with success; they consider it a rapid and simple method.

Reference.—[1]*Rev. de Chir.* July 10, 1908.

IONIC MEDICATION. (*See section* Electrotherapeutics, *also article* Neuralgia.)

IRITIS. *Ernest E. Maddox, M.D., F.R.C.S.*

Clarke and Mayou have reported to the Ophthalmological Society an extremely interesting case of *tuberculous iritis*, a picture of which is presented, by their courtesy (*See Plate XI, Fig. B*, p. 220). The right iris of a boy aged three years presented the

appearance, there delineated, of a group of nodules of various sizes on the lower and inner margin of the pupil. The iris was bleached, and many new vessels were easily seen over its whole surface, as will be made out by careful scrutiny of the picture. There was a small amount of keratitis punctata, the pupil dilated fairly well under atropine, and the vitreous was clear. The diagnosis of tubercle was established in several ways. First, the opsonic index for tubercle was found to be 0·45. Second, the inoculation of $\frac{1}{1000}$ mgram of **Tuberculin** (T.R.) excited a definite local reaction, viz., ciliary injection, and increase in size of the nodules and in the amount of keratitis punctata. Three weeks later the opsonic index was 1·00, there was general improvement, and the nodules were smaller. A similar inoculation was then made and repeated every two or three weeks, the opsonic index fluctuating between 1·00 and 1·50. In spite of an amount of disorganization of some of the structures of the eye, as evidenced by synechiæ and cataract, the tuberculous process was entirely conquered within nine months, all the nodules having disappeared. The natural colour of the iris returned almost completely about seven months after commencement of the treatment, the other eye giving a slight positive reaction to Calmette's test.

The instruction of such a case as this is very great, for not only was the diagnosis beyond dispute, but the processes were visible to the eye, and the cure was attributable to the tuberculin alone, since it appears to have been effected in a great city, without the aid of change of air or other treatment, except that he had for one week after admission pulv. hydrarg. c. creta, gr. 1 at night, and for three weeks cod-liver oil.

Charles Wray's **Acetezone** treatment of iritis, which he combines with large potations of water, is certainly worthy of trial. His view is that irritation is caused in the anterior chamber by the interaction of toxins and antitoxins, in a manner somewhat similar to that which takes place in Pirquet's test for tuberculosis. His supposition, which is fairly probable, is that the first effect of toxins in the anterior chamber is to cause swelling of its epithelial cells, and that this contributes to lessen the permeability of the filtration angle. The object of the exercise in the open air, upon which he lays stress, is to quicken the circulation and thus increase the opsonic content of the anterior chamber. It no doubt acts also by driving a larger quantity of blood through those organs of the body which destroy and get rid of toxins, such as the liver and kidneys. The copious potations of water are intended to stimulate these glands, while the acetezone is an intestinal antiseptic which it is hoped may reach and deal with one of the commonest sources of toxins. It is a strong antiseptic, and, as proved by its toleration in typhoid, innocuous. The drug is given in capsules containing $\frac{1}{2}$ gr. each, one before breakfast, others at 11 a.m., and 3 and 6 p.m. The larger part of a tumbler of water is imbibed before each capsule, and the remainder after. Two pints of water are to be taken before breakfast, with a walk in the open air fifteen minutes after each,

and then a rest for fifteen minutes before breakfast. With each of the remaining capsules one pint of water is taken, followed by a walk for fifteen minutes.

There are certainly many cases in which treatment on these lines, modified as individuals may require, should result in considerable benefit. Dilatation of the pupil by atropine must of course not be omitted.

A thoughtful paper by Beaumont,[1] of Bath, deserves mention, in which he endeavours to show, from a considerable experience in the Royal Mineral Water Hospital there, that rheumatic iritis is much less common in such a *clientèle*, and gonorrhœal iritis far more so, than is generally supposed.

Fukala,[2] of Vienna, advocates the use of **Atropine** in much stronger solutions than the usual 1 per cent, whenever dilatation of the pupil is delayed, pointing out that atropine crystals are not injurious to the eye, though used by many. Their danger lies only in the possibility that the lacrymal passages may introduce too much atropine into the system. He emphasizes the fact that atropine is quite useless when the pupil is fully dilated. He also advises laving the ocular conjunctiva with 1–4000 **Sublimate Lotion**, after cocainizing the eye, once daily. The combination of cocaine with atropine, as is well known, not only promotes the absorption of the atropine, but assists the dilatation of the pupil by stimulation of the dilator pupillæ. It is not, however, to be recommended as a routine treatment, but only as an aid in obdurate cases. To some extent cocaine shares the disadvantage of adrenalin, a drug decidedly detrimental in iritis, since by contracting the superficial arterioles it drives the blood into the deeper parts of the eye. **Mercury** is valuable in all forms of plastic iritis. In rheumatic varieties, **Aspirin** and hot water, sweat baths, **Leeching** if severe, and local warmth (*see* EYE, THERAPEUTICS OF). **Dionin** sometimes relieves pain. It is of course irrational to combine it with adrenalin as is sometimes done, since their effects are diametrically opposite. Blisters are but rarely indicated. Gentle laxatives if necessary, light digestible diet, avoidance of stimulants, and phenacetin with caffeine for early morning pain, complete the treatment. Acute pure iritis is rarely if ever gouty. This does not mean that gouty iritis is rare, but that if acute it is almost invariably accompanied by cyclitis. There is also a gouty "quiet iritis."

Gouty cyclitis or iridocyclitis is a frequent cause or precipitant of acute glaucoma, and if promptly treated on anti-gouty lines with local depletion and continuous warmth, many an operation can be averted.

REFERENCES.—[1]*Brit. Med. Jour.* June, 1908; [2]*Münch. med. Woch.* Oct. 1907.

ITCHING, ITS CAUSES AND TREATMENT.[1]

E. Graham Little, M.D., F.R.C.P.

Itching, or pruritus, is essentially a surface sensation, located in the epidermis, and best typified in the itching caused by the burrowing of the female acarus in the epidermis. It may occur without any skin

disease, as in the pruritus of the senile, apart from pediculosis, though this is no doubt the most frequent cause of that condition. Eczema is probably the skin disease most often the cause of itching. Several plants may produce this sensation by contact with the skin, e.g., primula obconica, humea elegans, etc. Mycosis fungoides in early stages, dermatitis herpetiformis (as distinguished from pemphigus), Hodgkin's disease, severe jaundice, are all frequently accompanied by this sensation in an exaggerated degree. Certain localities of the body are the seat of a peculiarly chronic and distressing form of this symptom, such as the anus, the vulva, the clefts of the toes, the meatus of the ears, the inside of the nostril. In all such cases the general condition of the patient must be fully investigated before one is satisfied with local measures. Sometimes, especially in senile cases, the function of sweating is in abeyance, and the treatment should then be with nightly subcutaneous injections of **Pilocarpine** for a couple of weeks. The clothes worn next the skin should be of silk or linen.

In the itching of eczema, especially in the dry and chronic form, lotions are better than other measures, and the following formula is recommended (Boeck) :—

℞	Talci		Sol. Acid. Borici in aqua (1%)	100
	Pulv. Amyli		Glycerini	40
	Liq. Plumb. Subacet. dil.	āā 100	Aq. Camphoræ	250

This should be well shaken before being used, and painted on uniformly with a stiff brush every four hours. **Unna's Zinc Glycerin Jelly** is very useful in affording pressure to the parts, and thereby ameliorating itching :—

℞	Glycerini Alb.	30	Glycerini	50
	Zinci Oxidi	50	Aq.	90

This when liquefied to the consistence of milk is painted over the surface to be treated, and touched with cotton wool, some of which adheres to the dressing. In later stages, when the eczema has become dry, the following lotion is useful :—

℞	Picis Carbonis	℥j	Acetone	℥ij
	Benzol	℥iv		

This solution should be filtered and applied with a brush in a thin coating.

Lichen planus, often an intensely itchy affection, is benefited by the application of Boeck's lotion, cited above. Cold cream, containing one drachm of chloral camphor to the ounce, is also recommended. In the itching of the vesicating erythemata, the following lotion is advised :—

℞	Ol. Amygd.		Cretæ Precip.	āā ℥iv
	Liq. Calcis	āā ℥iij	Acidi Borici	℥j
	Zinci Oxidi			

When bullæ are actually present or have just burst, the following powder may be dusted on :—

℞ Acidi Borici gr. xxv | Talci Pulv. ℥j

and the part wrapped in absorbent wool and bandaged. In cases of pruritus ani which may be thought due to hepatic insufficiency, the milder purgatives, such as **Euonymin, Bismuth, Soda and Rhubarb, Compound Sulphur Lozenge of Garrod,** are better than mercurial cholagogues. When pruritus ani is found with internal piles, a nightly suppository of **Hamamelin,** or an enema of 2 dr. of **Liquor Bismuthi** in 2 oz. of thin warm starch may be given. For local application in these cases the following cream is extolled :—

℞ Lanolini ℥v | Aq. Camph. ℥iiss
Ol. Amygd. ℥iiss | Hydrarg. Ammon. gr. vj

Or the parts may be painted with a solution of 10 gr. of nitrate of silver in 1 oz. sp. æth. nitrosi. The patients should be cautioned not to use paper in their anal toilet, but to clean the part with water and a soft sponge.

In itching of the feet, careful washing and drying is urged, and the following local application :—

℞ Cold Cream ℥j | Tumenol gr. xlviij

This stains the skin dark, which hardly matters in this position.

Kromayer[2] gives the following formulæ as being favourite prescriptions of his own in cases of pruritus cutaneus and pruritus ani :—

℞ Naphthol 1–5 parts | Vaselin. Alb.
Lanolini | Aq. Dest. āā 30 parts

℞ Naphthol | Vaselin. Alb. āā 30 parts
Acid. Carbol. āā ·5 to 3 parts | Aq. Dest.
Aq. Dest. | Aceti āā 15 parts
Lanolini

℞ Anthrasol | Vaselin. Alb.
Acid. Salicyl. āā 5 parts | Aq. Dest. āā 30 parts
Lanolin

℞ Ol. Santal. 10–50 parts | Vaselin. Alb. ad 100 parts
Lanolin

References.—[1]*Lancet*, Sept. 26, 1908; [2]*Deut. med. Woch.* Jan. 9, 1908, in *Med. Rec.* July, 1908.

JAPANESE RIVER FEVER. (*See* Tsutsugamushi.)

JAUNDICE, CATARRHAL.

(*Vol.* 1908, p. 26)—**Ovogal,** which is a compound of bile-acids from fresh ox bile with albumin, brings about rapid relief when administered in doses of ℥ss to ℥j. It acts by increasing the secretion of bile.

JEJUNUM, CANCER OF. *Rutherford Morison, F.R.C.S.*

Chas. Keyser[1] records a case of cancer with its primary focus in the first portion of the jejunum. Cancer of the intestinal tract usually occurs at the points where there is a change in the lining of the canal. The rarity of cancer in the small intestine, especially in the jejunum,

may be judged from the following statistics. In twenty-four years, from 1870 to 1893 inclusive, 41,838 necropsies were conducted at the Pathological Institute of the Vienna General Hospital. Of these 3585 were carcinoma, and 343 of them were in the intestines. Seven occurred in the duodenum, ten in the ileum, and none in the jejunum. Of eleven cases collected by him, six were males and five were females. The growth frequently shows spheroidal as well as columnar cells, and in some instances the growth is entirely spheroidal-celled. The symptoms of cancer of the small bowel are not unlike those of the cæcum or upper part of colon—pain, often colicky, and a tendency to constipation and diarrhœa.

REFERENCE.—[1]*Lancet*, Aug. 1, 1908.

JOINTS, ANKYLOSED. *Priestley Leech, M.D., F.R.C.S.*

Many attempts have been made to prevents ankylosis in joints, and also to restore motion to joints after they have become ankylosed. Resection, interposition of soft parts and of foreign bodies, e.g., gold, celluloid, etc., have been followed with more or less success, generally the latter. Lexer,[1] of Königsberg, has in several cases placed a portion or the whole of the joint from an amputated extremity into the space left by resection of an ankylosed joint. Weglowski first tried implantation of cartilage from the rib between the bony surfaces of the elbow after removal of superfluous bone, the perichondrium being placed in contact with the raw surface of the bone. The patient died of pneumonia five weeks after, and although only one joint surface had been covered with cartilage, the operation was successful. Lexer first tried transplantation of cartilage on both surfaces with success; he then transplanted the entire knee-joint from a newly amputated extremity into the cavity chiselled out in resection of an ankylosed knee-joint in a girl of eighteen; the same operation was done by substituting for the removed phalanx of a finger the phalanx from a toe amputated a few hours previously.

REFERENCE.—[1]*Surg. Gyn. and Obst.* June, 1908.

KATAPHORESIS. (*See section* ELECTROTHERAPEUTICS, *also article* NEURALGIA.)

KELOID.

(*Vol.* 1908, pp. 34, 98, 99)—Softening has followed the injection of **Thiosinamine** (10 per cent in equal parts of glycerin and water). **Radium** and the **High-frequency** spark have also proved serviceable.

KERATITIS. (*See* CORNEA, DISEASES OF.)

KIDNEY, CALCULUS IN. (*See* CALCULUS.)

KIDNEY, MOVABLE.

(*Vol.* 1906, p. 282)—Treves's weighty opinion as to operation for fixing the kidney, is that it is not necessary in the great majority of cases. When "torsion symptoms" have appeared, operation should be performed as soon as possible. The underlying neurasthenia so common in such cases is best treated by a **Rest Cure**, which often removes all the renal symptoms. He warmly recommends a truss devised by himself, which is described in detail with an illustration. In 95 per cent of his cases it proved absolutely efficient.

KIDNEY, TUBERCULOSIS OF. *E. Hurry Fenwick, F.R.C.S.*

The international consensus of opinion upon the operative treatment of this disease allows of the following propositions being considered as accepted:—It is mostly a unilateral disease. Its evolution is fatally progressive, with long-lasting remissions. All medical means are useless, and only a surgical intervention consisting in nephrectomy can stop its dangerous action, local as well as general. Nephrectomy will give better results if performed early. Nephrotomy, a palliative operation, is applied only when nephrectomy is contraindicated, that is, when the general condition or advanced bilateral renal lesions are against it. The new exploratory methods of renal functions have greatly and evidently improved the results obtained by nephrectomy, and the gravity of this operation, which was very great at first, is now very small. But to obtain such results it is necessary that the disease be found out at its beginning. Early diagnosis, utilizing all the recent methods at our disposal, early nephrectomy—such is the actual watchword of surgery in relation to renal tuberculosis.

Heresco[1] states that Kümmel had 10 per cent of deaths before employing ureteric catheterization, and now he records 3 per cent. Raffin had 43 per cent of deaths before ureteric investigation, and has now 5·5 per cent. Albarran had 28 per cent under similar circumstances, and now has only 1 per cent. Guisy[2] voices certain conclusions generally conceded at the International Urological Congress of 1908: (1) Since we have new means of investigation for an accurate diagnosis, we assert that total nephrectomy alone radically cures unilateral tuberculosis of the kidney, and that nephrotomy must be performed only as an exception in uncertain cases, when the functional capacity of the opposite kidney cannot be determined or when the cellulo-adipose "*atmosphere*" of the diseased kidney is hardened, or firmly or extensively adherent to the surrounding organs, especially to the peritoneum; (2) When both kidneys are tuberculous, operation must be rejected: (3) When only one of the kidneys is tuberculous and the other works well, the intervention must take place as soon as possible: (4) When only one of the kidneys is tuberculous and the other does not work well, nephrectomy must be also practised: (5) When only one of the kidneys is tuberculous, the general state of the patient being bad and cachetic, nephrectomy must be performed: (6) A large resection of the ureter in case of tuberculous ureteritis is unnecessary after nephrectomy, the ureter undergoing atrophy and being transformed into a fibrous cord. (7) Tuberculous cystitis gets much better, and may even completely disappear after nephrectomy, provided that the uretero-vesical lesions are not too advanced. (8) Calmette's ophthalmic reaction is another method of investigation that may lead to an accurate diagnosis in the first and second stages.

[These very sweeping views will hardly commend themselves to that conservatism which by tradition, habit of thought and training has hall-marked British surgery. Moreover, it is obvious to those who

have had large experience of general surgery that patients with renal tuberculosis do improve and live for years in comparative comfort. Much ought to depend on the extent to which the kidney is involved; this can only be faintly and remotely guessed at by employing all the modern methods of renal research, such as cystoscopy, radiography, and ureteric-catheterization. More attention in determining the acuteness of the disease will be paid to evidences of destruction by the tubercle bacilli, and by those septic bacilli unwittingly but unwisely grafted on the original disease by the practitioner when he washes out the bladder.—E. H. F.]

References.—[1]*1st Congress Internat. Urolog. Assoc.* p. 316; [2]*Ibid.*

KNEE, AFFECTIONS OF. (*See also* Fractures.)

Priestley Leech, M.D., F.R.C.S.

Reduction of Displaced Semilunar Cartilage.—Jacob[1] describes the following manœuvre for reducing a displaced semilunar: The patient lies on a bed or couch, the surgeon standing on the outer side of the limb with his face towards the patient's feet; the patient then raises his leg off the couch in the semi-flexed condition. The surgeon grasps the leg in both hands, and using his own thigh as a fulcrum against the patient's thigh, by means of a steady pulling movement draws the patient's leg outwards. Directly this movement is effected the patient must steadily extend the limb, and the displaced cartilage will probably go back with a click. If the first movement is not successful, the manœuvre must be repeated without any hurry or unnecessary force.

Rupture of Ligamentum Patellæ.—Though rupture of the quadriceps muscle is a common accident, what is practically its continuation—the ligamentum patellæ—is so much stronger that its rupture has seldom been recorded. Painter[2] has reported two cases of this injury. The disability is greater than in fracture of the patella, the two cardinal symptoms being a loss of ability to extend the leg and a gap in the ligamentum patellæ, but swelling and tenderness may obscure the gap, and the severity of the injury may for a time be thought sufficient to explain the inability to extend the knee. In both cases the patients fell heavily upon the flexed knee, and the rupture took place close to the attachment to the patella. Both were successfully treated by incision and suture.

Relaxed Knee Joint.—Freiberg[3] has come across two types of this condition: in one the symptoms are like those due to an injury of a meniscus; in the other class there is complaint of joint pain altogether or largely dependent upon the function of the joint, the pain being for the most part referred to the front of the joint, frequently under the patella. Ascending or descending steps is usually described as particularly painful, and after prolonged walking or standing, pain may continue for some time after the joint is at rest. After unusual use of the joint serous effusion may ensue, which disappears after abstaining from the use of the joint for some time. During the intervals

between the attacks the joint appears normal unless very carefully examined. That which is characteristic is a shrinking in the volume of the quadriceps extensor muscle of the affected side, which can be seen by the eye and measured by the tape. This muscle is normally the "tensor" of the knee-joint capsule, and being weakened it does not hold the capsule taut, and the capsule remains relaxed during movement, and is liable to become nipped between the head of the tibia and the condyles of the femur. In some cases the history of trauma is slight, and its osteological relation may be overlooked. The atrophy cannot be explained in all cases by the theory of "inactivity," but is due to a reflex action. The X rays show nothing, and it is difficult in some cases to exclude some degree of villous hypertrophy. The treatment is devoted to restoring the muscle to its normal condition by faradic stimulation, massage, graduated exercises, and attention to the general health.

REFERENCE.—[1]*Brit. Med. Jour.* Mar. 7, 1908; [2]*Bost. Med. and Surg. Jour.* June 18, 1908, quoted in *Lancet*, Sept. 12, 1908; [3]*Amer. Jour. Med. Sci.* May, 1908.

LABOUR. (*See also* PREGNANCY, and PUERPERAL STATE, DISORDERS OF.) *Victor Bonney, M.S., M.D., B.Sc., F.R.C.S.*

A discussion on Cæsarean section and other means of treating obstructed labour was opened at the annual meeting of the British Medical Association by Dr. Jardine,[1] who said that when the true conjugate is $2\frac{1}{2}$ in. or under, the case for **Cæsarean Section** is clear, since all other methods of delivery, even craniotomy, become impossible or dangerous. With conjugates varying from $2\frac{1}{2}$ to $3\frac{1}{2}$ in., however, the abdominal operation comes into comparison with these, and chiefly with the comparatively modern procedures of **Symphysiotomy** and **Pubiotomy.** Between these two there is little to choose on the score of risk or efficiency. Jardine is not much in favour of them, but admits that there are occasions when they are indicated in preference to Cæsarean section. This is particularly so in prolonged labour in which attempts to deliver by the natural passages have already been made. The easiest of the two is symphysiotomy, because it requires no special instruments; but there is a risk of tearing the vagina, or wounding the bladder, which is largely unavoidable. He is not one of those who consider craniotomy of the living child unjustifiable in these days, holding that where the patient comes under hand in a dirty and neglected condition, and after prolonged attempts at forceps delivery, the risk of any operative procedure is too great to undertake, even to obtain a living child. With this view I cordially agree, more especially as in such cases, although the child may be still alive at the time the case comes under treatment, yet the question whether it will survive birth, or surviving it, live long afterwards, is very doubtful. It is surely a disaster of the first magnitude to have exposed the patient to the risk of what is often, as Jardine points out, a compound fracture of the pubic bones, and as a set-off only to have delivered a dead child, or one that dies soon after.

As regards induction of labour, the author quoted does not speak highly from the point of view of the child, but allows that the proceeding should be attended with but very slight risk to the mother. It is useless to induce before the thirty-second week. "The head is the best pelvimeter we have"; and induction should be determined on directly it cannot be easily pushed into the pelvis.

Professor Zweifel, of Leipsig, who followed him, specially discussed symphysiotomy and the extraperitoneal Cæsarean section of Frank and Sellheim. In regard to the first of these, he points out that the value of the operation should be judged solely by the results of the modern subcutaneous method, which has abolished many of the risks previously held up against the procedure. The technique is simple, and consists in encircling the cartilage with a Gigli's wire saw by means of a curved Bumm's needle. The subsequent delivery should be left to nature to complete, if ruptures of the vagina are to be avoided. Turning to extraperitoneal Cæsarean section, he first describes the technique of the operation. It is very difficult to retract the peritoneum intact from off the lower segment of the uterus and the apex of the bladder. He therefore makes a small transverse incision low down, and turns the peritoneum back, guided by the view thus obtained of its reverse surface. Having done so, he sutures the gap before opening the uterus, the wall of which is divided transversely. In the four cases he has performed, the head had to be extracted by forceps through the incision; all the patients recovered, but one developed an abscess at the site of the wound.

Von Kronig, who also spoke, stated that of twenty-one cases of symphysiotomy and pubiotomy performed by him, four of the children died at or soon after birth. Considering that the operation is performed solely in the interests of the child, this result is to him not very encouraging. He is convinced that these operations should not be performed in pelves having less than a 7 cm. conjugata vera, and not even then unless the head has already shown a fair disposition to come into the pelvis. He spoke well of the extraperitoneal Cæsarean operation in non-infected cases; but said that in those already exhibiting fever the sanguine expectations formed as to its safety were not realized in practice.

Pfannenstiel[2] on the whole is unfavourable to this operation. To begin with, a complete subperitoneal operation, as recommended by Frank and Sellheim, is not always possible, and therefore in many cases the parietal peritoneum must be divided. The two authors named, as well as Veit, have under such circumstances united the upper edge of the parietal peritoneal incision with the upper edge of the transverse incision through the peritoneum covering the cervix, and have thus attempted to exclude the general peritoneal cavity from the operation area. Pfannenstiel points out that such is not an absolute guarantee against sepsis entering the peritoneum, and that to this has to be added the risk of opening up a large area of cellular tissue through a wound which is very difficult to drain. Drainage

further tends to subsequent hernia. He concludes, that it is questionable whether we are justified in exposing the mother to these dangers solely in the interests of the child, and he considers that in all cases in which infection may be surely assumed, or distinctly suspected, the child's head should be perforated, or where the pelvis is too narrow for this a Porro-Cæsarean section should be performed. Other Continental obstetricians, however, such as Bumm,[3] Latzko,[4] and Fromme[5] speak well of the operation, but, curiously enough, from different standpoints. Thus Bumm considers it contraindicated in seriously infected cases; whilst Fromme recommends it in just this type of patient.

A dispassionate consideration of the merits and demerits of these newer methods of treating obstructed labour leads one to the following conclusions:—Symphysiotomy and pubiotomy are undoubtedly successful methods of treatment in a good proportion of cases; but there are associated with them certain grave risks, namely, the liability to vaginal or vesical lacerations, with consequent sepsis, and a considerable chance of the child being born dead, or dying soon afterwards. The risks are so definite that it is most unlikely in my opinion that these operations will ever obtain much hold in this country, even in lying-in hospitals, and certainly not in private practice. There will occasionally arise, no doubt, situations and circumstances in which they will be performed as the operation of election—of election, that is to say, not only on the part of the surgeon, but of the patient and her relatives. But the vast majority of persons knowing the risks would hesitate to allow those who are dear to them to be subjected to an operation fraught with such evil possibilities on the somewhat dubious chance of obtaining a living child.

As regards extraperitoneal Cæsarean section the case seems worse still, and I cordially agree with the remarks of Pfannenstiel just quoted. The present age is prodigal of new operative devices, many of them more or less extravagant in their nature and aim, for the limits of rationally simple and simply rational surgery have very nearly been reached, so that those who would innovate must perforce develop extravagant ideas. The operation in question is a partial reversion to the older one of "laparo-elytrotomy," laid on the shelf some fifteen years ago. Then, as now, the theoretical advantage of extraperitoneal incision of the genital canal was held to compensate for enormously enhanced operative difficulties. Apart from the fact pointed out by Pfannenstiel that the peritoneum is probably as well, or better, fitted to resist microbic attack than the cellular tissues, it is certain that in surgery, as in most other things, the simplest is the best; and that where delivery can be effected easily and rapidly with a minimum disturbance to the parts, it is not likely that a far more complicated proceeding, involving much manipulation, an increased area of suture implantation, and an extensive, tortuous, and ill-drained wound, will be found to give better results. It is natural to every surgeon to look with an eye of favour on the production of his ingenuity.

PLATE XXIII.

KILLIAN'S TRACHEOBRONCHOSCOPY.

Modified by Brüning.

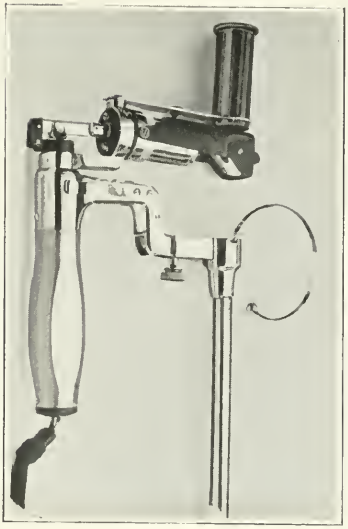


Fig. A.

Fig. B.

PLATE XXIV.

KILLIAN'S TRACHEOBRONCHOSCOPY.

Modified by Brünning.

Fig. C.

Fig. D.

Time alone can show whether his claims are justified. In the case of extraperitoneal Cæsarean section it may be anticipated that a few years will consign it to the limbo of discredited operations.

REFERENCES.—[1]*Brit. Med. Jour.* Sept. 19, 1908; [2]*Jour. Amer. Med. Assoc.* Aug. 29, 1908; [3]*Centr. f. Geb. u. Gyn.* 1908, No. 14, in *Brit. Jour. Obst. and Gyn.* Aug. 1908; [4]*Münch. med. Woch.* 1908, No. 22, p. 1211, in *Ibid.*; [5]*Centr. f. Gyn.* 1908, No. 17, in *Ibid.*

LARYNGOSCOPY AND TRACHEOBRONCHOSCOPY.

William Milligan, M.D.

In the *Medical Annual* of 1908 an excellent description (with illustrations) of the methods of tracheobronchoscopy adopted by Prof. Killian at his clinic in Freiburg is to be found. The instruments formerly used by Prof. Killian have recently been modified by his assistant, Dr. Brüning. The illuminating apparatus or electroscope (Brüning) (*Plate XXIII, Fig. A*, and *Fig.* 65) not only makes the

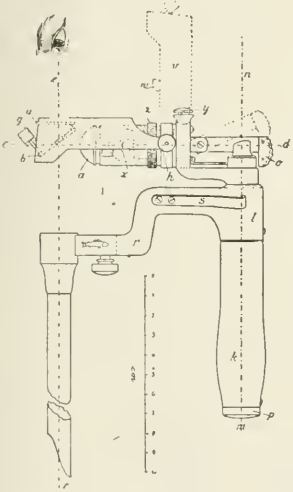


Fig. 65.—Brüning's Electroscope with spatula.

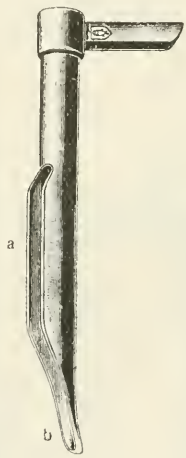


Fig. 66.—Tube Spatula.

illumination of the field independent of the skill of the particular operator, but permits also of the free manipulation of instruments. The source of light is a small lamp (*x*), which from its ingenious construction allows the securing of almost parallel rays of light. The light is capable of being condensed by the lens (*a*) and accurately focussed by means of the milled ring (*z*). The projection of the light along the tube spatula (*f*) is effected by means of a small mirror (*b*), which revolves on the axis *cd*. The movements of the mirror are controlled by the screws *g* and *h*.

The manipulation of instruments within the tube spatula (*Fig.* 66) is facilitated by the following device. The handle (*k*), and with it the

lamp and mirror, can be rotated in the arm of the tube carrier (*rl*) to the right or to the left, and extended by means of an extension

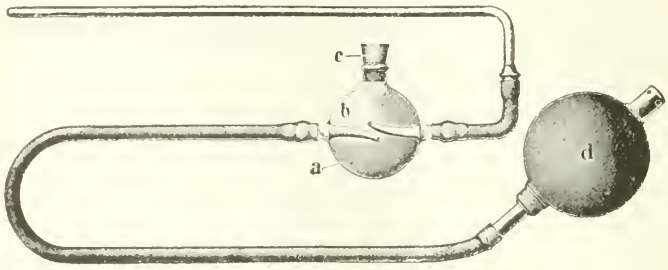


Fig. 67.—Suction Pump.

shaft having a triangular cross section a distance of about 12 cm. By means of this device neither the operator's hand nor the handle of the instrument obstructs the line of vision, whilst the central perforation in the mirror remains exactly over the centre of the tube. The rectangular form of the instrument enables the operator to secure a good grip and to exert equable pressure upon the base of the tongue, etc.

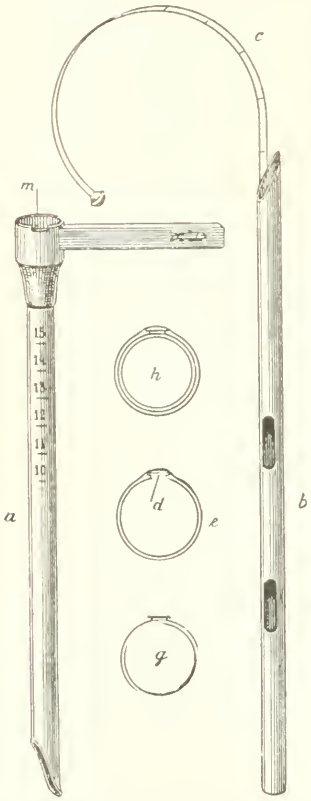


Fig. 68. Spatula with extension tube.

To clear the field of mucus, blood, etc., a suction pump (*Fig.* 67) operated by a small rubber suction bulb is employed.

For the direct examination of the larynx, tube spatulæ of various sizes (*Fig.* 68) are used. To anæsthetize the mucosa, often peculiarly irritable, especially when foreign bodies are present, a special cocaine atomizer (*Fig.* 69) is made use of.

To examine the deeper regions of the trachea, the carina, and the bronchial tree, various sized bronchoscopic tubes with extension shafts are employed.

The inner or extension tube (*Fig.* 68, *b*) is made to accurately fit the tube spatula (*a*). By means of a watch-spring attachment (*c*) the inner tube is propelled forwards. When introducing the inner tube, the watch-spring should be grasped close to its

attachment to the inner tube, as the closer it is grasped the greater the pressure which can be exerted.

For operative purposes an ingeniously devised forceps, capable of extension (*Fig.* 70), is used, while blades of various sizes and forms

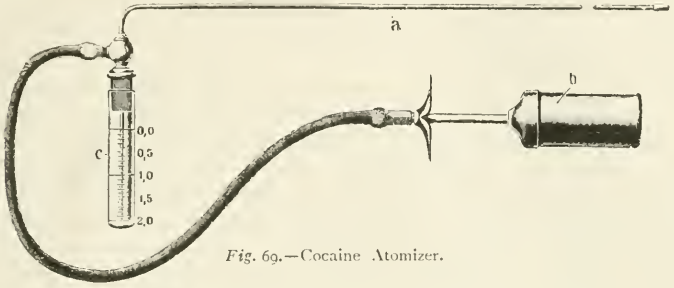


Fig. 69.—Cocaine Atomizer.

(*Fig.* 71), to meet varying indications, for the removal of foreign bodies, have been constructed.

Tracheobronchoscopy may be made use of with the patient sitting

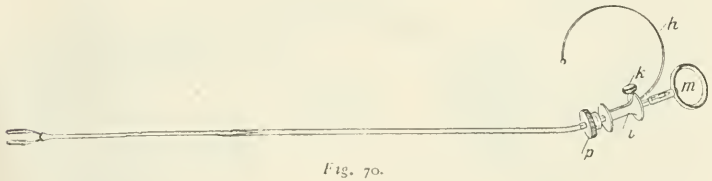


Fig. 70.

upright (*Plate XXIII, Fig B*) upon a low stool, or lying upon the side or upon the back with head extended. Inferior bronchoscopy may also be practised with the patient in the upright or supine position

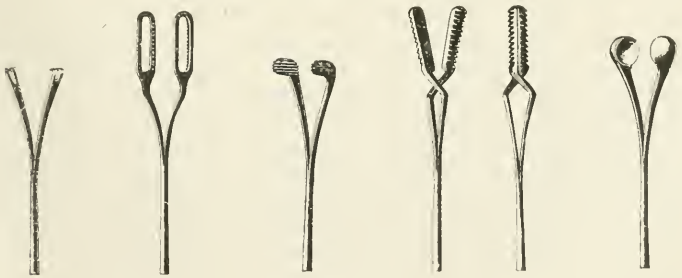


Fig. 71.

(*Plate XXIV, Figs. C* and *D*). All tube spatulæ or bronchoscopic tubes should be well warmed and oiled before introduction.

The value of "direct" examination of the upper air-passages and œsophagus, both from a diagnostic and therapeutic point of view,

has already been attested by the publication of numerous papers and records of cases.

In a series of 164 cases of foreign bodies lodged in the air-passages, collected by Prof. Killian, and divided into two classes, hard foreign bodies and foreign bodies not hard, the success attending extraction under the direct control of the eye is amply testified.

LARYNX, DISEASES OF.

William Milligan, M.D.
D. Lindley Sewell, M.B.

To obviate the difficulty so frequently experienced in manipulating an overhanging epiglottis, Cyril Horsford[1] has designed an instrument (*Fig. 72*) which is a modification of Kurz's suturing forceps used for the passage of deep sutures in pelvic surgery. After cocainizing the upper laryngeal orifice, a needle is first threaded with a long piece of silk and placed in the proximal blade of the forceps. With the aid of a laryngeal mirror, it is introduced into the throat until the upper border of the epiglottis is seen to pass between the point of the needle and the distal blade. The handles of the forceps are now closed, then opened, and the instrument withdrawn. It will now be found that the suture has passed through the epiglottis. The silk threads are then brought out over the tongue and clamped together with a pair of artery forceps.

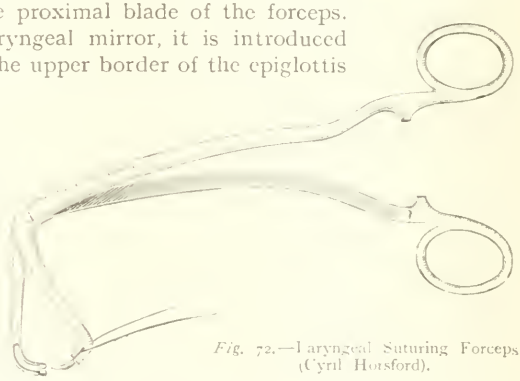


Fig. 72.—Laryngeal Suturing Forceps (Cyril Horsford).

The Treatment of Innocent Laryngeal Growths by the Galvano-cautery.—A. Wylie[2] claims that the advantages of galvano-caustic treatment of innocent laryngeal growths are: (1) Very minute growths can be obliterated; (2) Small vascular growths can be removed without the risk of hæmorrhage; (3) It is far superior to chemical caustics; (4) The technique is more reliable, more precise, and involves less risk of damage to adjacent structures; (5) The whole operation is within view of the surgeon; (6) That by it small sessile growths on the mesial surface of the vocal cords are more thoroughly treated than by forceps; (7) The stumps of growths already removed by other instruments can be obliterated by the cautery; (8) The galvano-cautery cuts off the blood supply and thus kills the growth, while the forceps often only removes the superficial parts; (9) It diminishes the liability of local infectivity of papillomata. Local anæsthesia is produced by dropping an alkaloid solution of cocaine in olive oil into the larynx with a Wingrave's syringe.

Cancer of the Larynx.—In the treatment of laryngeal cancer,

Sendziack[3] considers that total resection is indicated when the disease is extensive or advanced, or when it has recurred after a previous laryngo-fissure. He bases this opinion upon the following statistics: 50 per cent of cases were cured by laryngo-fissure, 46 per cent by the endo-laryngeal method, 23 per cent by partial unilateral resection of the larynx, and 22 per cent after total resection. When recurrences are taken into account, the following was, however, found: 22 per cent of the cases recurred after laryngo-fissure, 30 per cent after partial or unilateral resection, 33 per cent after endo-laryngeal operations, and only 16 per cent after total resection.

Tuberculosis of Larynx.—S. A. Knopf and A. J. Huey,[4] in discussing the treatment of laryngeal phthisis, advocate the employment of a **Kuhn's Mask,** the use of which is based on Bier's original idea of having the patient inhale in a slightly obstructed manner, so as to produce a negative pressure in the thoracic cavity. Made of thin celluloid, the mask has the shape of the mouthpiece used to cover

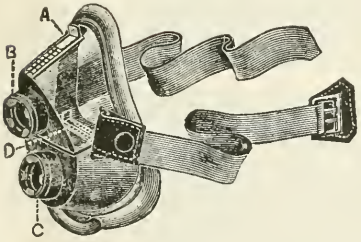


Fig. 73.—The Kuhn Suction Mask for the treatment of pulmonary and laryngeal tuberculosis

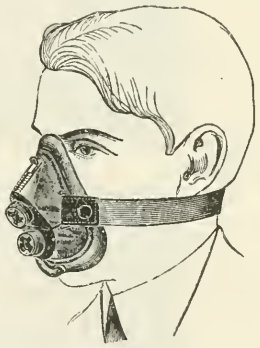


Fig. 74.—Patient breathing through the Kuhn Suction Mask.

the patient's face when administering one of the volatile drugs for general anæsthesia. The edges here, too, are protected by rubber tubing which can be filled with air. The mask is divided transversely by means of a celluloid wall, which rests with its border on the upper lip. This border also is provided with an inflatable pad. In this way we have two separate cavities, one for the nose and one for the mouth, there being no communication except by a slide covering a narrow slit in the transverse dividing wall. This slit is opened only if the nasal respiration is temporarily or permanently interfered with. The mask is placed over the nose and mouth of the patient, and held in place by two elastic straps passing below the ears and fastened at the back by means of a buckle. Another slide, attached to the outer side of the nasal section of the mask, controls the degree of obstruction desired (*Fig. 73, A*). This is the essential part of the device, inasmuch as by it we regulate at will and by degrees the amount of obstruction to the passage of air into the alveoli of the lungs. It

has a scale of 6°, and covers a slit somewhat less than $\frac{1}{16}$ inch (1 millimetre) wide and somewhat longer than the one in the partition membrane between mouth and nose cavity. Two caps, which can be screwed off, each embracing a small celluloid plate, form the valves for expiration, in the same manner as in the ordinary narcosis inhalers. (*Fig. 73, B* and *C*). "If the regulating slide be entirely open, the patient can inhale some air, but naturally never as much as without the mask. Inspiration is done through the nose, and expiration either through the mouth alone or through both mouth and nose. If desired, the valve over the mouth section of the mask could be entirely removed. But this should be done in the case of intelligent patients only, as then special attention has to be paid to the act of respiration. During sleep this valve, too, should always be in place."

By means of the mask a series of cases were treated. The authors consider that the Kuhn mask is a practical means of applying the Bier treatment to the mucosa of the upper respiratory tract, and that as the result of its regular employment local anæmia disappears, symptoms improve, and ulcers assume a more healthy appearance.

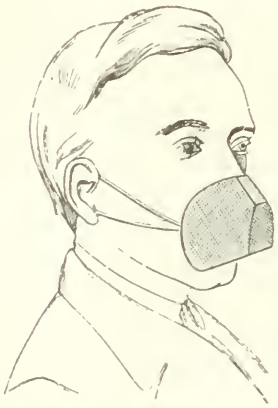


Fig. 75.—Perforated Zinc Inhaler.

Beverley Robinson[5] insists upon the value of (1) rest to the larynx, and (2) dry vaporized antiseptic inhalations by means of a **Perforated Zinc Inhaler** (*Fig. 75*). For inhalation, **Creosote** and **Alcohol** in equal parts are recommended. In cases where there is an irritable cough, a mixture of creosote, alcohol, and chloroform in equal parts should be employed. The inhalers should be worn continuously day and night, only being removed at meal times. Six or eight drops of the mixture are dropped on the sponge every hour while the patient is awake, and several times during the night.

References.—[1]*Lancet*, July 11, 1908; [2]*Ibid.* Nov. 23, 1907; [3]*N.Y. Med. Jour.* Nov. 30, 1907; [4]*Med. Rec.* Feb. 22, 1908; [5]*Amer. Jour. Med. Sci.* Aug. 1908.

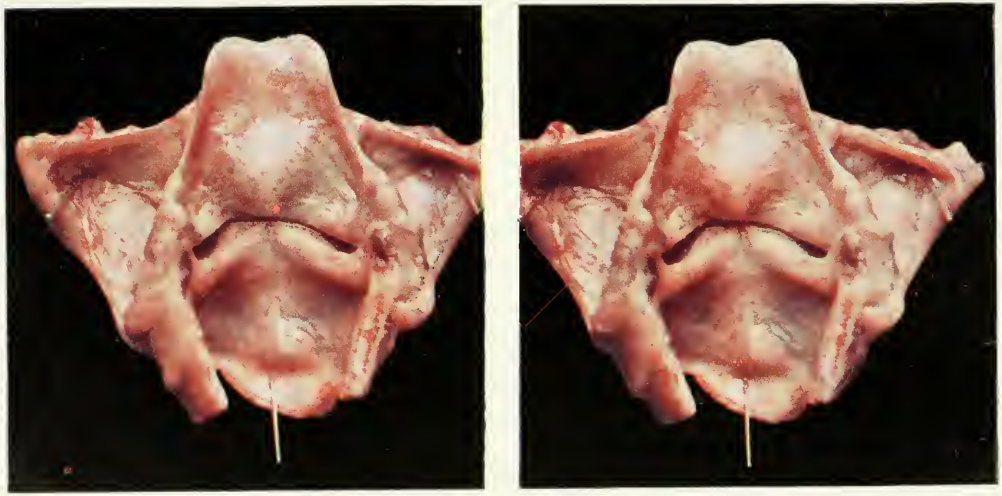
LARYNX, THE. (Normal and various Pathological conditions illustrated stereoscopically.) *P. Watson Williams, M.D.*

By the courtesy of Dr. Garel, of Lyons, who has devoted much time and skill to the development of a method for directly photographing the larynx in the living patient, we are enabled to represent several stereo-laryngoscopic pictures of normal and diseased larynges. The first, *Plate XXV*, is a colour-stereoscopic picture of a normal larynx split vertically through the cricoid cartilage, and clearly demonstrates the possibilities of using this process for recording exactly the appearances of anatomical and pathological specimens.

The three following plates (*XXVI to XXVIII*) are photographs of

PLATE XXV.

STEREO VIEW OF NORMAL LARYNX—Photographed in Natural Colours by the Lumiere process.

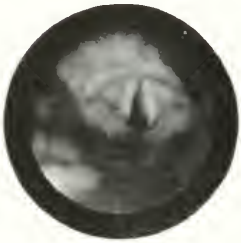


GAREL

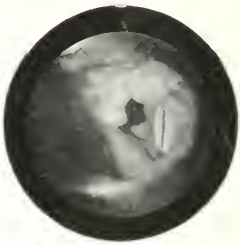
PLATE XXVI.

STEREO LARYNGOSCOPIC IMAGES *(from Life).*

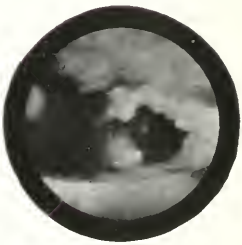
Normal Larynx.



Normal Larynx.



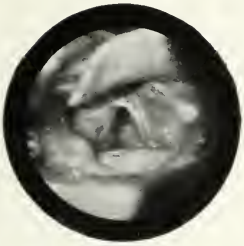
Ulcerating Gumma of Epiglottis.



Tertiary Syphilis.

PLATE XXVII.

STEREO LARYNGOSCOPIC IMAGES (*from Life*).



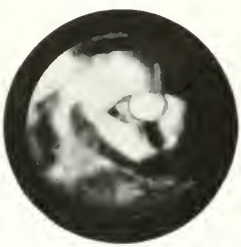
Tuberculosis.

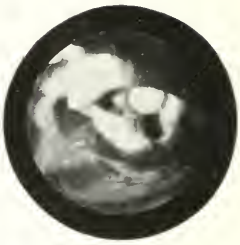
Tuberculosis

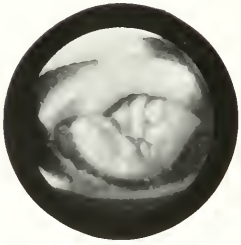
Tuberculosis.

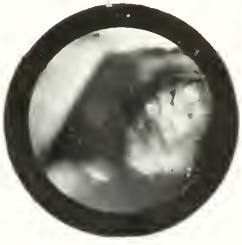
PLATE XXVIII.

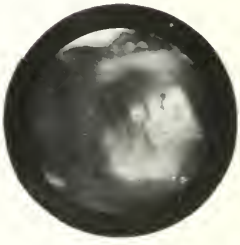
STEREO LARYNGOSCOPIC IMAGES *(Goh. Lee)*











P. W. W.

the larynx taken during life, and though they fall far short of the completeness and clearness of good drawings, they have a special value simply because they are actual photographs of the various conditions existing in the patient. It is very often highly desirable to have exact records of the condition of a larynx from time to time, to show the progress of disease or its gradual arrest. More especially for those who are unable to *draw* these "notes," the method introduced by Dr. Garel may prove of great practical value, for although the pictures hitherto obtained leave much room for criticism, there is reason to hope that better results still may follow from improved technique.

LEPROSY. *J. W. W. Stephens, M.D.*

W. M. Robson[1] gives the following formula of an ointment used by Malcolm Morris :—

R	Acid. Salicylic.	gr xx	Zinci Oxidi	gr xxx
	Ichthyol	ʒss	Vaselini	ad ℥j
	Hydrarg. Oleatis (10%)	ʒss		

Chaulmoogra Oil is given in addition in capsules, commencing with 10-min. doses three times a day, until about 1 dr. is tolerated thrice daily.

Vergueira[2] uses **Collargol,** intravenously, subcutaneously, and cutaneously. For subcutaneous injection a 1 or 2 per cent solution of collargol is used, together with a filtered 2 per cent cold solution of egg-albumen ; 5–10 cc. of this solution are injected together with 1 cc. of 1 per cent β-eucaine solution between the shoulder-blades. For intravenous injection 2 to 4 cc. of a 2 to 4 per cent collargol solution are injected. The injections were made on the fourth, seventh, fourteenth, and thirtieth days. In all the cases treated, hair that had been lost grew again. Good results were also got in beri-beri, tabes, etc.

Deycke[3] describes his researches, together with R. Bey, on leprosy. They obtained from non-ulcerated lepromata, by throwing back a flap of skin and taking fragments of tissue, and by incubation in normal salt solution for several weeks at 37° C., abundant growth of a streptothrix which they call *S. leproides.* What the relation of this organism to the leprosy bacillus may be is uncertain, but the authors feel sure it is not a contamination. They found that injections of this organism had marked curative effects on leprosy. They proceeded next to discover to what constituent of the streptothrix the action was due, and found it to be due to a neutral fat which they have named **"Nastin."** Injections of suitable doses of pure nastin produce intense reaction in the leprous tissue, sometimes so violent as to be dangerous to life ; some cases, however, proved to be entirely refractory. Microscopically it can be shown that *pari passu* the bacilli break up and lose their fat, as shown by the fact that they no longer stain red with carbol fuchsin, but blue with methylene blue. As nastin induced a marked leucocytosis when a reaction occurred, attempts were made in those cases which had proved resistent to produce a reaction by intravenous injection of sodium cinnamate (hetol). When the leucocytosis

was at its height, nastin, on injection, now produced so violent a reaction as to be dangerous. Eventually a substitute was found for cinnamic acid, viz., **Benzoyl Chloride** in 2 per cent solution. The mode of action is supposed to be the following: the nastin attaches itself to the lepra bacilli, the benzoyl then removes the fat of the bacilli, and so produces its antibacterial effect. In short, the sum of the researches is, as the author states, "Benzoyl-nastin is an agent which directly acts on lepra bacilli." The author warns those about to try this remedy that there are some nodules which seem unaffected by the remedy, while others are dissolved as a syphilitic eruption by mercury; it has, in fact, its limitations, but it is innocuous, and in the author's opinion constitutes a real advance in the treatment of the disease. Nastin can be obtained as a commercial product.

Diesing[1] finds the subcutaneous injection of **Iodoform Olive Oil** emulsions the most effective—two injections of ½ cc. of a 30 per cent emulsion, and if these are tolerated, 2 cc. daily for fifteen to twenty days. Loss of appetite, weakness, pallor, or a smell of iodine are indications for withholding the injections until the symptoms have subsided. In young healthy patients as much as 8 cc. of a 30 per cent emulsion may be injected. In nervous and cardiac diseases there is a danger of injury being done. The author obtained in six weeks disappearance of all external signs and a general improvement, and bacilli disappeared from the nose.

Duque[5] recommends the use of a plant called in Havana the **Red Mangrove Tree.** An extract is prepared by mixing: of the plant 1000 parts, alcohol 200, glycerin 350, water 450 (how given is not stated). Cures in early cases ensue in eight to twelve months, in old cases in two to five years.

Sugai[6] succeeded in infecting white rats with leprosy by injecting intraperitoneally $\frac{1}{10}$ of an emulsion of leprosy tissue.

REFERENCES.—[1]*Brit. Med. Jour.* May 2, 1908; [2]*Rev. med. de S. Paolo*, Nos. 18 and 24, 1907, in *Münch. Med. Woch.* March 10, 1908; [3]*Brit. Med. Jour.* Ap. 1, 1908; [4]*Deut. med. Woch.* 1907, xx. in *Arch. f. Schiffs u. Trop. Hyg.* 1908, No. 6; [5]*Amer. Jour. Derm.* Dec. 1907, in *Ibid.*; [6]*Med. Ges. zu Tokio*, Feb. 20, 1907, in *Ibid.*

LEUCORRHŒA.

(*Vol.* 1906, p. 25)—**Glycerinum Hydrastis** is a useful local application in subacute and chronic cases.

LEUKÆMIA.

J. G. Emanuel, B.Sc., M.D.
L. G. J. Mackey, M.D

Sufficient evidence has been brought forward in recent years to show that the **X rays** are capable of exercising a beneficial action in many cases of myelogenous leukæmia, although the benefit may be only temporary. The most obvious result is a marked diminution in the number of white cells, the patient feels better, and the spleen and liver diminish in size. After a time, however, the patient appears to acquire a sort of immunity to the rays and ceases to derive any benefit therefrom. Exactly how the X rays do good is not understood,

but there is some reason to suppose that a leukolytic body is developed in the blood of the patient under treatment; and in support of this may be quoted experiments showing that the serum of an animal treated with X rays, when injected into another animal, causes a diminution in the number of white cells, while the injection of a normal control serum causes a leucocytosis. Again, Capps and Smith[1] proved the serum of a leukæmic patient undergoing X-ray treatment contains some substance capable of destroying leucocytes, both in animals and in other leukæmic patients.

Henry Harris[2] reports five cases of myelogenous leukæmia treated with the X rays; and in each case there was a marked reduction in the number of white cells, but in only one case can this treatment be said to have had very much effect on the course of the disease, but in the one case the improvement was striking, both in the general condition of the patient and in the blood picture. Applications were made three times a week for three months, then every five days for two months, and after that, as the patient improved, at longer intervals. A medium or medium high tube was employed; the distance of the tube from the body was 25 to 30 cm.; time of exposure, 7 to 15 minutes; amperage 7 to 10 with the higher tubes; voltage 10 to 120. The regions exposed were the splenic (anteriorly and posteriorly), the dorsal, the two thighs, the epigastric, and the sternal. Dermatitis was carefully avoided. The treatment was started three weeks after the patient was first seen, during which time he had grown perceptibly worse; the improvement began almost immediately after the X-ray treatment was commenced. The following table showing the changes in the blood-count in one of his cases is instructive:—

Date	X ray applications during the month	Red cells	White cells	Hæmoglobin	Remarks
				Per ct.	
Aug. 23, 1905	3	2,000,000	632,000	30-35	
Aug. 29, 1905		2,240,000	528,800	40	
Sept. 6, 1905	13	2,500,000	255,200	40	
Sept. 16, 1905		2,360 000	245,600	38	
Oct. 4, 1905	13	3,000,800	360,800	50	
Oct. 24, 1905		3,160,000	133,600	52	
Nov. 2, 1905	6	3,550,000	62,400	55	
Nov. 28, 1905		3,020,000	13,200	60	
Dec. 16, 1905	6	3,784,000	8,400	60	
Jan. 4, 1906	6	3,968,000	16,800		Laryngitis of 10 days' duration
Jan. 28, 1906		3,120,000	3,400	60	
Feb. 14, 1906	4	3,440,000	3,000	60	
Mar. 10, 1906	4	2,820,000	4,600	60	
Apr. 3, 1906	4	2,400,000	3,600	50	Discontinued X rays after earthquake of 1906
Sept. 18, 1906		4,000,000	10,000	70	
Apr. 9, 1907		3,464,000	85,260	60	
May 10, 1907	2	3,536,000	109,100	70	
June 14, 1907	4	4,100,000	104,800	67	
July 24, 1907	4	4,100,000	165,000	67	

Dr. Harris is careful to lay stress on the fact that X-ray treatment is only palliative and not curative, and he gives tables of the blood changes in his four other cases, of which three had ended fatally at the time of the publication of his paper.

REFERENCES.—[1]*Jour. Exper. Med.* Jan. 1907; [2]*Amer. Jour. Med. Sci.* July, 1908.

LICHEN PLANUS.

(*Vol.* 1907, p. 361)—Radcliffe Crocker recommends **Thymol** gr. v, **Ol. Olivæ** ℥j, rubbed in with pressure, to allay the itching. Internally he gives **Salicin**; in widespread cases, **Quinine** gr. v in an effervescing mixture is preferable. When the patient is weakened by overwork, **Mineral Acids** and **Nux Vomica** should be given. Walker advises **X Rays** for obstinate cases.

LIMP, INTERMITTENT.

(*Vol.* 1906, p. 309)—**Rest**, during and for several weeks after an attack, is essential. The feet must be warmly clad and not allowed to hang down. **Iodides** are indicated by the invariable presence of arterial disease, and **Erythrol Tetranitrate** or **Nitroglycerin** should be given. Excess in tobacco and alcohol must be forbidden.

LIPOMATA.

(*Vol.* 1908, p. 365)—In a case of multiple lipomata, decrease in the size of the larger tumours, with complete and permanent disappearance of the smaller ones, was obtained by painting the skin over each swelling with **Ethylate of Sodium**, one to three times a week. The patient, a beer-drinker, was forbidden alcohol, and ordered breathing exercises and Swedish movements; the general condition improved concurrently with the disappearance of the tumours.

LIVER, SURGERY OF.

John B. Deaver, M.D., LL.D.
Astley P. C. Ashhurst, M.D. } *Philadelphia.*

Of late years surgical treatment of diseases of the liver has assumed an important place in general surgical work. Until recently hepatic abscess was about the only lesion which was uniformly regarded as belonging to the sphere of surgery; later, hepatic cirrhosis, with ascites, came within the surgical horizon; and now, malignant and other neoplasms are beginning to be regarded as possibly amenable to surgical treatment.

Diseases of the Liver Amenable to Surgical Treatment have been discussed by Clarence A. McWilliams, of New York.[1] Speaking of *cirrhosis of the liver*, he quotes the following figures, showing the results from the operation of **Epiplopexy**: Koslowsky, 168 cases, 46 per cent of cures of the ascites; Greenough, 105 cases, 42 per cent cures; Monprofit, 224 cases, 35 per cent cures; Bunge, 33 per cent permanent cures, and 33 per cent improved. McWilliams refers to four patients of whom he had personal knowledge, who remained well respectively fifteen months, two years, four and a half years, and six years after the operation. He calls attention to the fact that "very successful results have been obtained by performing the operation of drainage of the biliary passages (cholecystostomy) in the hypertrophic variety of cirrhosis of the liver accompanied by icterus. This follows from the established fact that certain cases of cirrhosis are primarily due to infection carried by way of the bile passages from the intestine to the liver." Terrier, Michaux, Delagenière, Cumston, and others, have had brilliant success by such treatment. E. R. Corson[2] advocates Narath's method of epiplopexy for cirrhotic ascites, in preference to the Talma-Drummond operation. In the former the omentum is drawn out of the abdomen and stitched to the subcutaneous tissues, the abdominal wound being carefully closed so as not to strangulate the pedicle of omentum. In Corson's patient the superficial abdominal veins began to enlarge in a week, supporting Narath's contention, and marked

improvement continued eighteen months later. Lieblein[3] reports fifteen operations for cirrhotic ascites from Wölfler's clinique. Various forms of epiplopexy were done, Narath's subcutaneous transplantation having been employed in three patients: in one of these a typical intraperitoneal operation had to be done later, owing to the development of symptoms of occlusion of the intestine (*Darmundurchgängigkeit*). In three of the patients exploratory operation only was done; of the twelve others, four died from peritonitis, which in two was attributed to the use of suprapubic drainage, and in the other two was caused by bursting open of the incision with prolapse of the intestines. A fifth patient died from pneumonia. Of the seven patients who survived the operation, two died about two months later without improvement; the improvement in two others was only transient, while in three the improvement had lasted thirteen, eighteen, and twenty-two months respectively after the operation, and in all these three the operations had been done by Narath's method.

Abscess of the Liver.—McWilliams (*loq. cit.*) reports sixteen operations for abscess of the liver, from the Presbyterian Hospital, N.Y. "None of these cases were instances of abscess secondary to abdominal operations for other purposes. Six patients had more than one abscess, of which number four died; while ten patients had single abscesses, and of these, three died." When the physical signs are doubtful, he advises exploratory puncture, under a general anæsthetic, the patient being prepared for a formal operation. At least six punctures should be made, he believes, before the attempt to find pus is abandoned. Of course the needle should be sterilized anew before making each puncture.

Malignant Disease of the Liver.—McWilliams reports twenty-five cases of malignant disease of the liver operated on at the Presbyterian Hospital, N.Y. In seven of the cases an erroneous diagnosis was made before operation. A distinct tumour was palpable before operation in eighteen patients, and it was absent in seven. Eight of the patients had some degree of fever before operation, and this fact was accountable for the surgeon diagnosing abscess of the liver in three patients. Excision is to be undertaken only "when the tumour is primary and solitary, when its margins are clearly defined, when it is quite certain that the whole of the tumour can be removed, and, in malignant cases, that such a margin also can be cut away as to make it probable that recurrence will be prevented or will be long postponed. Gummata should not be removed unless calcification or other degenerative changes in an advanced stage are discovered" (Moynihan). Keen has collected seventy-six cases of resection of tumours of the liver, sixty-three patients recovering from the operation.

For *Prolapse of the Liver*, McWilliams advises the use of a suitable support, and thinks hepatopexy or excision of a Riedel's lobe is rarely indicated. We think it should not be forgotten in regard to Riedel's lobe that Terrier found it disappeared spontaneously after the gall-bladder condition, usually responsible for its development, had been properly treated by operation.

Tuberculosis of the Liver.—Bunzl[1] reports a case in which Schnitzler successfully excised a tuberculous mass from the left lobe of the liver of a young man. The differential diagnosis from gumma is considered, but Bunzl thought that the histological structure of the growth and the previous tuberculous lesions in the patient showed that the growth was not syphilitic. In checking the hæmorrhage from the liver during the operation, a tampon soaked in adrenalin solution was employed with much satisfaction.

Transdiaphragmatic Stab Wound of the Liver.—In a case of this kind, the wound being in the fifth right interspace just without the mammillary line, Fasano[5] successfully sutured the liver by the transpleural route, preventing pneumothorax during the operation by keeping the lung in expansion by means of forceps, and at the end of the operation by suturing the margins of the phrenic wound to the structures of the chest wall, thus excluding the pleural cavity from the wound, which was tamponaded. There can be no doubt, we think, that in the vast majority of cases of injury of the diaphragm, the surgeon should prefer the thoracic to the abdominal route. Especially is this true of stab wounds. The following table from our work on the "Surgery of the Upper Abdomen" (vol. i.) shows the results of the operations recorded for stab-wounds of the diaphragm:—

Operation	No. of Cases	Recovered	Died	Mortality Per cent
Thoracotomy	65	61	4	6·15
Laparotomy	19	14	5	26·31
Thoraco-laparotomy	6	4	2	33·33
"Combined operation" ..	4	3	1	25·00
Total	94	82	12	12·7

Nor is the much higher mortality in cases treated by laparotomy due, as might be thought, to more serious injuries than in the cases of patients treated by thoracotomy. Suter quotes figures to show that among those cases complicated by wounds of the abdominal viscera, the mortality from thoracotomy was 8·3 per cent, while the death-rate from laparotomy and other operations was 50 per cent. It should perhaps be explained that by thoraco-laparotomy is understood an operation in which thorax and abdomen are opened separately; and by "combined operation" one in which both cavities are opened by a single incision.

A New Liver Suture has been described by Van Buren Knott.[6] He very frankly states that he has not yet had an opportunity to try this suture upon the human being, but, with him, we see no reason to think it would not prove satisfactory, and prevent the tearing out of the sutures which, even with carefully applied mattress sutures, has hitherto been so universal.

"Parallel with the wound in the liver or with the area to be excised, and about half an inch from its edge upon either side, insert deeply through the liver substance by means of a large, round, blunt needle, shown in *Fig. 76*, a strand of No. 3 catgut. These needles, as well as

the small, blunt needle mentioned later, are modifications of Kousnietzoff's liver needles which have been so successfully used and have proved very satisfactory. These strands should enter the liver tissue about one inch beyond the edge of the wound, run deeply through the liver substance, and emerge the same distance from the opposite end of the wound. The ends of these catgut strands are now fastened by drawing them up snugly and tying to either end of both strands a

Fig. 76.—The sunken catgut strands in the tissue parallel to the wound to be sutured.

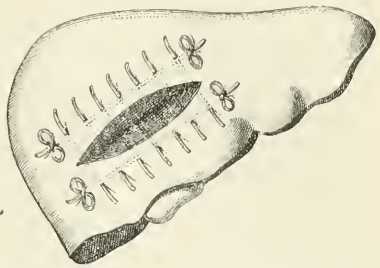


Fig. 77.—The transverse interrupted suture introduced.

small ordinary skein of catgut, which, presenting a broad surface against the liver tissue, prevents the indrawing of the suture ends. Transverse interrupted sutures (*Fig.* 77) of No. 3 catgut are now introduced by means of a small blunt needle, also shown in *Fig.* 76, in such a manner that they engage upon either side of the wound the buried long strand of catgut. These may be tied as rapidly as introduced, and

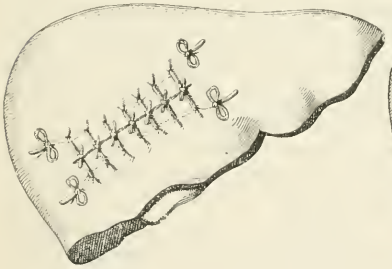


Fig. 78.—The transverse sutures tied.

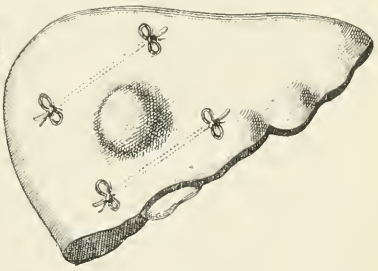


Fig. 79.—Long parallel sutures introduced as a preliminary to the excision of a tumour from the liver.

exerting their traction upon the buried long suture, may be tied snugly (*Fig.* 78), ensuring hæmostasis and coaptation without the danger of their cutting out. When it is desired to remove a portion of the liver tissue carrying with it a tumour, this may be done by excising between the buried long sutures (*Fig.* 79) a wedge-shaped ellipse of liver substance and introducing the transverse sutures as above described. Hæmorrhage during this procedure may be controlled

either by manual pressure or by elastic ligature until the transverse sutures are tied, when it will immediately cease."

REFERENCES.—[1]*N. Y. Med. Jour.* Dec. 7, 1907 ; [2]*Ann. Surg.* Dec. 1907 ; [3]*Münch. med. Woch.* Dec. 31, 1907 ; [4]*Ibid.* Mar. 3, 1908 ; [5]*Il. Policl.* Oct. 13, 1907 ; [6]*Ann. Surg.* Nov. 1907.

LUDWIG'S ANGINA. *Priestley Leech, M.D., F.R.C.S.*

Turner Thomas,[1] of Philadelphia, has a long article on this subject, with an extended bibliography. His conclusions are that Ludwig's angina is a rapidly spreading cellulitis, beginning in the region of the submaxillary salivary gland as a perilymphadenitis, and extending to the floor of the mouth and pharynx. The primary focus is some lesion in the neighbourhood, e.g., a carious tooth, tonsillitis, or ulcer in the mouth. As a rule the streptococcus, alone or mixed with other organisms (as the staphylococcus, the pneumococcus, or bacillus of malignant œdema), is the infective agent ; this, however, may be the staphylococcus or any organism capable of producing a rapidly spreading cellulitis. Death as a rule results in most cases from invasion of the larynx. In a considerable number of cases the lungs are also involved. The associated septic intoxication is probably no more severe than that which results from streptococcus infections of the same grade in other parts of the body.

The opening in the muscular buccopharyngeal wall through which the submaxillary gland projects into the floor of the mouth is the path by which the submaxillary infection invades the mouth and pharynx. Any rapidly spreading cellulitis in the floor of the mouth is a menace to the life of the patient, as the anatomical conditions there favour the early involvement of the larynx. A cellulitis beginning in the floor of the mouth is more dangerous than a cellulitis of the same grade beginning in the submaxillary fossa, since the larynx will be more easily and surely invaded. For the same reason, the most dangerous cases are those in which the phlegmonous process begins in the larynx or pharynx, and these should be placed in a separate group from the standpoint of prognosis and treatment.

Incisions in the floor of the mouth may be advisable in a few cases for the relief of excessive swelling, but they have rarely given satisfactory results. The median suprahyoid, while the safest of the external incisions, does not expose the usual primary seat of infection, and should not be selected except to evacuate an evident purulent collection in the submental region. The submaxillary incision, i.e., over the submaxillary triangle and parallel with the lower border of the jaw, will probably locate an existing pus collection in the greater number of cases. If frank suppuration is not found before, the mylohyoid muscles should be divided and the sublingual tissues exposed. On account of the added irritation of a general anæsthetic to an already dangerously inflamed larynx, local anæsthesia will in all probability prove to be the more valuable means of controlling the pain during the making of the incision.

REFERENCE.—[1]*Ann. Surg.* Feb. and Mar. 1908.

LUNG, COLLAPSE OF. (*See* BRONCHITIS.)

LUNG SURGERY OF. *Priestley Leech, M.D., F.R.C.S.*

Eugen Bergeat[1] publishes the results, with essential details, of 135 cases of resection of the thorax in large, long-standing empyemata. From consideration of his own cases, he comes to the following conclusions: (1) In by far the majority of cases of old empyemata or empyematous fistulæ, healing can only be obtained by means of Schede's operation. (2) The resection must be sufficiently extensive to begin with, for insufficient removal only prolongs the duration of the disease. (3) Experience of the radical extensive operation shows its advantages. (4) The contraindications are only a bad general condition of the patient or extensive amyloid degeneration. (5) Old, extensive, tuberculous empyemata should be operated on if the condition of the lung and the general condition of the patient allow it. (6) In children, resection of the thorax should be done early, and sufficiently widely, because regeneration of the bones may be expected. (7) The combination of Schede's method of thoracic resection and Delorme's method of decortication should be attempted in every case where the pulmonary pleura is thickened. (8) Before any attempt at operation, a thorough examination of the relations of the intra-thoracic organs should be made.

REFERENCE.—[1]*Beitr. z. klin. Chir.* Bd. 75, H. 2.

LUPUS ERYTHEMATOSUS. *E. Graham Little, M.D., F.R.C.P.*

Macleod[1] sums up the general directions for the management of a case of lupus erythematosus: (1) Attention to the general health; (2) The avoidance of causes which produce flushing; (3) The administration of drugs which may act as antidotes to toxic poisonings, e.g., quinine, arsenic, iodide of potassium, and salicin. Of external remedies, the goal of treatment being to reduce local hyperæmia and moisture, mild measures are preferable to caustics; the following formulæ are suggested for this purpose:—

℞ Calaminæ Zinci Oxidi Zinc. Oxidi. | Magnes. Carb. āā partes æq.

As a powder.

℞ Calaminæ	gr. xv	Aq. Calcis	℥j
Zinci Oxidi	gr. x	Aq. Rosæ	ad ℥j
Glycerini	℥xxx		

For lotion.

℞ Ichthyolis	℥x	Lanolini	℥ij
Zinci Carb.	℥iss	Vaselini	℥ij
Amyli	℥i		

For paste.

For very small diseased patches, caustics may be used, e.g., pure carbolic acid, or 10 per cent resorcin in spirit.

X Rays, Finsen Light, and **High Frequency** have all been tried with this disease, a method of using the Finsen light by exposing the skin

at a distance of 10 in. from the lamp for half an hour every alternate day, without using a compressor, being recommended, after Norman Walker. X rays and high-frequency currents have been less useful.

Kanoky[2] uses, in the forms where there is hyperæmia and irritation, **Zinc Oil** (zinc. oxid. 60, ol. olivæ 40) or **Calamine Lotion** for several days, combined with **Salicin** (15 gr. after each meal, the dose being gradually increased). When there is no hyperæmia, the patches are painted at once with strong **Iodine** (Churchill's tincture) three times a week, and **Salicin** or **Quinine** is given internally. When there is much induration, the following paint may be used :—

R	Acid. Salicyl.	40	Collodion	100
	Acid. Pyrogal.	10		

To be shaken, and applied with a brush at night.

Alcohol, tea, coffee, and tobacco are prohibited, as well as all foods which cause flushing. The parts should be kept locally clean by soap and water. A new treatment recommended by Pusey, which promises well, is **Carbonic Dioxide Snow**, applied to the affected patches.

REFERENCES.—[1]*Pract.* Jan. 1908 ; [2]*Med. Rec.* Sept. 12, 1908.

LUPUS VULGARIS. *E. Graham Little, M.D., F.R.C.P.*

Pyrogallol is thought by Veiel[1] to have a selective action on lupus tissue. His method is as follows : Pyrogallol-vaseline, 10 per cent, is applied to the lupus tissue for several days. In verrucose forms preliminary use of the thermocautery or the caustic potash style is recommended. After several days use of the 10 per cent pyrogallol, blisters form, when a weaker application (2 per cent) is made ; by this means lupus tissue is still attacked, but granulations are not prevented. This application is continued until all suspicious lupus tissue is removed, and there are no more grey nodules to be seen in the red granulations. This often takes weeks, and when this object is attained, progressively weaker applications are made until the proportion of pyrogallol is only $\frac{1}{10}$ per cent. As a rule, this is kept on until complete cure results. If skinning over is not perfected with the weak application, pure vaseline is used, when the scar formation generally rapidly advances. The method requires a long application of pyrogallol in successively weaker doses. When the lupus tissue does not in the later stages react satisfactorily to the 2 per cent ointment, the 10 per cent must be again used for one or two days, and then the 2 per cent be resumed. The strong ointment (10 per cent) must not be risked over the cartilaginous tissues of the ear ; for these not more than 4 per cent strength must be used. Examination of the urine during the treatment showed no pyrogallol intoxication even when used over prolonged periods. The pain is usually bearable ; only in certain persons will morphia be necessary. The ointment is spread on lint with a wooden spatula (*not* metal), and a pad of wool (which should not be refined, but retain its natural fat) placed over, and bandages are applied carefully so as to exclude all air. In

changing the dressings, which is done morning and evening, the fresh dressings must be all ready for application, so that the wound is exposed for the shortest possible time. This is important, as the advent of air increases the pain. The treatment is best conducted with the patient in bed, owing to the difficulties of keeping the dressings intact when they are about. In cases where there is lupus of the mucous membrane as well, this must of course be treated also; in lupus of the nostril, plugs coated with the pyrogallol should be inserted; when breathing would be impeded by the plugs, these may be perforated with drainage tubes. In lupus of the palate, mouth, nose, and pharyngeal cavity the **Galvanocautery** is best employed. The cosmetic results of this treatment are claimed to be excellent, and as permanent as with any other method.

Lancashire[2] also recommends pyrogallic acid, in the form of plaster of 40 per cent strength, applied for a week or ten days, after which the surface is dressed with 10 per cent pyrogallic ointment for another week, and finally with carbolized zinc ointment. The same author further advises in deeply infiltrated cases the use of **Volkmann's Spoon,** followed by the repeated application of saturated **Zinc Chloride** solution, and dressings of carbolized zinc ointment. In all cases where there is surface suppuration this should be controlled first with local antiseptics. Isolated nodules of lupus tissue are best dealt with in the following way:—The surface to be treated is anæsthetized with novocain and adrenalin. A hard, wooden, pointed skewer is then driven into the nodules, and the hole thus made is filled with finely powdered potassium permanganate tightly packed, and a drop of water applied to the surface. A few hours later the spots should be moistened again. The plug of permanganate sloughs away in about a week, and the spot rapidly heals.

References.—[1]*Berl. klin. Woch.* Feb. 1908; [2]*Brit. Med. Jour.* Oct. 24, 1908.

LYMPHATIC OBSTRUCTION (Lymphangioplasty in the Treatment of).
W. Sampson Handley, M.S., F.R.C.S.

The treatment of lymphatic obstruction and its results has hitherto been very unsatisfactory. It has consisted either in mild and inefficient palliatives, among which postural treatment, bandaging, and the withdrawal of fluid by Southey's tubes, may be mentioned, or on the other hand in the removal *en masse* of the lymph-sodden tissues by extensive and bloody plastic operations, or by amputation. The methods of ablation have found their principal field of application in elephantiasis. The removal of a lymph scrotum is, I believe, a very satisfactory operation; but in elephantiasis of the limbs amputation has a very restricted field, and often such cases go to the grave unrelieved after dragging their monstrous burden for many years.

In elephantiasis pain does not appear to be a prominent symptom, and the muscles retain their power for many years. In these respects the disease offers a curious contrast to the allied affection which

in breast-cancer often results from the blocking of the lymphatic channels of the arm on the affected side. In the brawny arm of breast cancer, for reasons which are at present obscure, the lymphatic obstruction within a year or two produces irremediable paralysis of the muscles, while on the sensory side agonizing pain is an almost constant symptom. For this condition amputation of the arm at the shoulder joint has hitherto been the only cure.

The other forms of lymphatic obstruction are usually less extreme. Among them may be mentioned phlegmasia dolens, and the localized solid œdema which sometimes follows erysipelas. It is evident that the ideal method of treating all these conditions of lymphatic obstruction is, not to remove the diseased area, but to restore the lymphatic circulation in it. Since all or most of its lymphatic channels are destroyed, the problem is one of prothesis—how to provide the affected area with a new set of lymphatic vessels. This apparently difficult problem is in fact solved in a very simple manner by the operation to which I have applied the name lymphangioplasty. The method consists in the introduction into the œdematous limb or organ of a number of silk threads, which are completely and permanently buried in the tissues. The threads are led from the affected region to some region in which the lymphatic circulation remains unimpaired. By their capillary action they transfer the excess of fluid from the obstructed area to the tissue spaces of a healthy region, where the intact lymphatic vessels take up the excess of fluid brought to them, and carry it into the general circulation. Such is the theory of the operation. In practice its success has been very rapid and striking.

Doubt may be felt as to the permanence of the results attained. It may be said that silk is an absorbable material, and that the silk threads upon which the success of the operation depends must soon become eroded and destroyed by phagocytic action. But I am confident that silk is not absorbed so rapidly as is generally thought. I have in my possession a section of silk thread which had been embedded in the tissues of the peritoneum for nearly ten years. The thread is practically intact, although the silk fibrils upon its surface show the beginning of erosion. Moreover, in respect to my operation, two facts have to be remembered: first, that the silk is exceptionally thick; and secondly, that neither it nor the tissues around it are under the least tension. Round-celled infiltration about the silk, and consequent absorption, are evidently, under these circumstances, much less likely to occur than in the case of a tied ligature, strangling a portion of the tissues.

The foregoing reasons lead me to anticipate that the effect of lymphangioplasty will have a duration of at least ten years. Since my first operation was performed as recently as February, 1908, the actual test of time cannot yet be applied. All that can at present be said is that the œdema shows no sign of returning after the lapse of nine months, and that the pain is usually completely relieved.

THE PIONEER CASE OF LYMPHANGIOPLASTY.

(W. Sampson Handley, The Middlesex Hospital, Feb., 1908.)

Fig. A.—Before operation.

Fig. B.—About a month after operation. Note the lax fold of tissue behind the upper arm.

PLATE XXX.

THE FIRST CASE OF LYMPHANGIOPLASTY IN ELEPHANTIASIS.

(W. SAMPSON HANDLEY, The Middlesex Hospital, April, 1908.)

Fig. A. Before operation, but AFTER vaccine treatment and prolonged rest in bed.

Fig. B. The same case eighteen days after operation.

The accompanying figures (*Plate XXIX*) show my first case of lymphangioplasty for breast cancer.[1]

Into the actual details of the operation I do not propose to enter, since I have not yet settled all the technical points beyond modification. The silk is introduced by means of long probes which are pushed along the subcutaneous tissues through small incisions of access. All the incisions are subsequently sewn up. The silk and probes used may be obtained from Messrs. Mayer & Meltzer, of Great Portland Street, W. The most absolute asepsis is of course essential to the success of the operation, and in this respect difficulty may arise in hot climates, where septic organisms run riot.

One other important point must be referred to. In the brawny arm of breast cancer, as I have shown, the lymph is a sterile fluid. But in elephantiasis there is a vital factor to be reckoned with. In my case of elephantiasis[2] (*Plate XXX*), the first attempt at lymphangioplasty failed, owing to the occurrence of suppuration along the silk threads about the tenth day after operation, and all the silk had subsequently to be removed. The late onset of the suppuration, the comparatively slight constitutional disturbance which followed it, and the rapid healing which followed removal of the silk, led me to think that the suppuration resulted from bacteria already present in the tissues at the time of operation. Examination of the blood and lymph by Dr. Foulerton led to the detection of a diplococcus, closely resembling the organism which has been isolated by Dufougeré in tropical cases of elephantiasis. Dr. Foulerton prepared a vaccine for me by means of which in the course of two months the blood and lymph were rendered sterile. The operation of lymphangioplasty was thereupon repeated, with the marked success shown in the illustrations.

REFERENCES.—[1]*Arch. Middlesex Hosp.* vol. xii. p. 28; [2]*Lancet*, Jan. 2, 1909, and *Proc. Soc. Trop. Med.* 1908.

MALARIA. *J. W. W. Stephens, M.D.*

Sir L. Brunton[1] believes that quinine does not exert its full action, or indeed may fail to act at all, if the liver is engorged, and that it is well to prepare the patient for a course of quinine by a mercurial followed by a saline. The author also records a case of malaria which had remained latent for thirty-two years; but as the author himself points out, there was the possibility of the occurrence of sublatent or "subliminal" attacks having been unnoticed before the one in question.

R. Ross[2] states that the ideal procedure for the prevention of malaria in towns in the tropics consists (1) "In the removal of mosquito-breeding waters; (2) In the treatment of old cases of malaria with quinine; and (3) In the protection, as an additional safeguard, of hospitals, barracks, gaols, and as many houses as possible, with wire gauze. To these we must add, as insisted upon by Stephens and Christophers, the principle of segregation for Europeans." At Ismailia malaria has been reduced from 1551 cases in 1902 to 37 cases in 1905.

The cost of the operations amounted to an initial expenditure of 6·25 francs, and an annual expenditure of about 2·3 francs, per head of population. "The result is due chiefly to mosquito reduction, and also largely to cinchonization." At Klang and Port Swettenham, in the Federated Malay States, with a population of 4000 and a rainfall of 100 inches a year, the following has been the expenditure from 1901 to the end of 1905:—At Klang £3100, with an annual expenditure of £270, has been devoted to clearing and draining 332 acres; at Port Swettenham £7000, with an annual upkeep of £240, has been devoted to treating 110 acres. The result was that the cases of malaria fell from 610 in 1901 to 23 in 1905. In Hong-kong similar measures were carried out in rendering "nullas" smooth, training water-courses, buying up rice-fields, etc. The result is shown by the fact that the hospital admissions for malaria diminished from 1294 in 1901, the year when operations were commenced, to 419 in 1905. The expenditure up to 1906 is estimated at £6500. Other instances are described, and the author then again concludes that: (1) For tropical sanitation against both malaria and yellow fever (and probably filariasis) general mosquito reduction is by far the most practical, as it is the most fundamental, method, at least in thickly populated areas: (2) Prophylaxis by quinine, by screens, and by segregation may be attempted, if possible, in addition to the fundamental methods, but as regards tropical towns must be looked upon only as adjuvants to it.

[NOTE.—Segregation was advocated by myself and Christophers primarily in the case of small out-stations comprising, say, half-a-dozen European dwellings in the midst of numerous native huts. It is under such conditions, where drainage schemes are impracticable from lack of funds, that the removal of European bungalows from the proximity of natives, or, as the case may be, the removal and rebuilding of a dozen or more native huts, is attended with such beneficial results; in fact, it is no exaggeration to say that in many cases it means life and not death, and it is a great gratification and pride to us to know that the principle has been and is being applied in many instances.—J. W. W. S.]

W. J. R. Simpson,[3] discussing antimalarial sanitation, considers that the first step is to examine the children (native ?) to determine the presence of malaria. He then advocates the destruction of all mosquitoes in the neighbourhood of dwellings within a quarter-of-a-mile zone from the dwellings. If mosquitoes still fly in, then recourse must be had to mosquito netting. The actual drainage operations must depend on local conditions.

H. Ziemann,[4] discussing malaria prophylaxis, considers: (1) That the *extirpation* of malaria by quinine has only a limited application under certain well-defined conditions. For a quinine prophylaxis the author recommends 1 gram of quinine at bedtime every four days (first, fourth, eighth, etc.). (2) The destruction of mosquito larvæ by all available methods, including the growing of such plants as the waterpest (*Anacharis alsinatrum*), which covers the surface of the water and suffocates larvæ and nymphæ. (3) The protection from bites by

living in mosquito-proof houses—brass or nickel wire gauze being the best. Europeans should be required to live at least three-quarters to one kilometre from the malaria-infected natives ; the good effects of this are well known in Old Calabar, Accra, and the Camaroons. (4) The social condition of the native and also the European requires improvement in Africa.

Diesing,[5] in a paper full of interest, expresses the view that it is an error to attempt to kill parasites directly by any drug circulating in the blood, as the resistance of the protozoa is so great that in order to kill them so large a quantity of the drug is required that at the same time a not inconsiderable number of blood-cells would also be destroyed. Quinine does not act as a direct poison to the parasites, but it withdraws from them their nutriment, in that it forms, with the hæmoglobin of the red cells, a compound which passes into the plasma, and is thus withdrawn from the host and also from the parasites. Drugs which have this property of "influencing" the hæmoglobin are many, e.g., sulphuretted hydrogen, ammonium sulphide, the alkaline "ous" solutions, iron filings, or the blood poisons, phosphorus, arsenic, antimony, potassium chlorate, potassium permanganate, potassium sulphate. **Arsenic** has been long used in chronic malaria. The author has obtained good results repeatedly with **Potassium Sulphate** 0·03 : 30 (cc.) three times daily, a teaspoonful in a glass of water. With this treatment he combines **Sulphur Baths** (thiopinol bath).

Blackwater Fever.—C. P. Lukis[6] holds that the second and hitherto undiscovered factor in the causation of blackwater fever is not the malaria parasite, but the Leishman-Donovan body. [The absolutely fatal objection to the piroplasma and this theory is, that these parasites are not present in cases of blackwater fever.—J. W. W. S.]

D. McKay[7] contributes important observations on the action of quinine salts on the osmotic pressure of the blood plasma. If this is lowered, that of the red corpuscles will also be lowered, and hence a disruptive force exerted on the envelope of the red cells which may eventually cause them to burst and extrude their hæmoglobin. The osmotic pressure practically depends upon the number of *inorganic* molecules in solution. The author found that sulphates in any form, e.g., quinine sulphate, magnesium sulphate, or dilute sulphuric acid, produced a decrease in the total salt concentration of the serum, and the rapidity of the decrease varied directly with the amount of sulphates ingested ; hence sulphates produce a disruptive force on the red cells. In malaria the red cells are already injured by the parasite, so that the action of sulphates, e.g., of quinine, would all the more tend to produce a hæmolysis, i.e., a setting free of hæmoglobin. It is well known, however, that in many cases quinine has no such action in malaria ; there must be, therefore, in blackwater cases, some condition which produces yet another factor tending to cause a breaking-down of the red cells, in other words, a hæmoglobin. The author suggests that a difference of virulence of parasites may explain this. The fact that after an attack of blackwater fever the remaining red cells are

more resistant than usual to hæmolytic agents, the author explains by supposing the existence of an antihæmolysin. [In chronic malaria, on the contrary, there is no evidence of this increased resistance.—J. W. W. S.] The action of sulphates in producing this tendency to hæmolysis is due to the fact that they displace weaker acid carbonates, chlorides, etc., combining with their bases to form sodium and calcium sulphates which are then eliminated, as they are foreign to the plasma, and thus the blood becomes poorer in alkalies and total salts. The same results follow the administration of alkaline carbonates and combination of alkalies with vegetable acids. The author next found that chlorides had just the opposite effect to sulphates, the red cells being more than normally difficult to hæmolyze after the administration of chlorides, and he consequently suggests that in blackwater fever, instead of quinine sulphate, quinine hydrochloride should be given in combination with sodium chloride.

W. T. Prout,[8] after a preliminary account of the symptoms of blackwater fever, proceeds to describe the treatment. The intestinal canal should be first thoroughly emptied, best by **Calomel** 5 to 10 gr., in all cases, whether there is constipation or not; the result is almost always a large quantity of black foul-smelling fæces. If the bowels do not act freely within a short time, an **Effervescent Saline** s given, and if this is vomited, a large enema of soap-water should be given, with a little castor oil added. **Diaphoretics** and **Diuretics** should be next administered. In mild cases where the stomach can retain fluid, the old diaphoretic mixture of liq. ammon. acetatis and sp. æth. nitrosi, with the addition of acetate or nitrate of potash, is the best; but in severe cases, where the stomach rejects even a teaspoonful of water, no drugs should be given by the mouth: instead a warm normal saline solution is injected by means of a long soft rectal tube: the amount should extend to quarts. The enema may be repeated during the day. This serves the purpose of cleansing the gut preparatory to giving nutrient and medicinal enemata, and further, the saline absorbed acts as a diuretic. Diuresis may be assisted by adding digitalis to the nutrient enemata, and by the rectal administration of alcohol. In all cases where there is intense gastric irritability, a falling pulse, great restlessness, and diminishing urine, the author strongly advocates an **Intravenous Injection of Normal Saline.** His procedure is the following: The skin over one of the large veins at the elbow is cleaned and the vein dissected out. A ligature is passed under the vein and tied; the vein is opened above this, and the cannula inserted and tied in. The saline is kept in a sterile glass reservoir at 100° F., and is prepared by adding two solids of sodium chloride to a pint of boiled water. On the tube leading from the reservoir to the cannula there should be a clamp. A pint or more is injected according to the condition of the pulse.

The second step is to counteract the malarial element. If parasites are found, at least one dose of **Quinine** should be given, carefully watching to see if there is any recurrence of hæmoglobinuria. If the

history shows that the attack was due to quinine, then it should be withheld. The best method of giving quinine is a hypodermic of the neutral hydrochlorate, 5 to 8 gr.; or by rectum, 15 gr. of **Quinine Hydrochlorate** are dissolved in bovril gruel as a nutrient enema, quinine not mixing well with milk.

The third consideration is to maintain the patient's strength. In milder cases food may be given in small quantities frequently, such as Brand's essence of beef, sterilized milk and soda, thin arrowroot, bovril, etc. A little brandy or champagne at intervals is beneficial. But where vomiting is a prominent and distressing symptom, no food should be given by the stomach, as the strength can be maintained for several days by **Rectal Feeding.** After the large soap enema given in the morning, as previously, the patient is allowed to rest for a little, and the nutrient enemata are given every two hours throughout the day. The enema should amount to 2 to 4 oz.; or if they are given with the long tube, 7 to 8 oz. may be retained, and as they are required less frequently, disturb the patient less. Peptonized milk and egg is the best enema to give. Bovril and Brand's essence are more stimulating, and to them it is often well to add ½ oz. of brandy, but not more than 6 to 8 oz. in the twenty-four hours should be given. **Digitalis, Ammonium Carbonate** or **Strychnine** may also be added to the enemata.

The fourth consideration is to alleviate distressing symptoms. Vomiting may sometimes be relieved for a considerable time by giving the patient as much water as he can drink. Occasionally a copious draught of two tumblerfuls will entirely check the vomiting; in other cases the washing-out of the stomach and the vomiting of the bilious matter gives a few hours' relief. Thirst may be alleviated by allowing the patient to wash out the mouth with water acidulated with fresh lime-juice, or by painting the tongue with glycerin and citric acid mixture. Pain in the back may be temporarily relieved by friction with a liniment containing opium. Sponging the body with tepid water with some eau-de-Cologne or Florida water and fresh lime-juice added, is soothing. Bathing the hands and arms is also very refreshing. Sleeplessness is met by a hypodermic of morphia if necessary.

The *after-treatment* should comprise arsenic, iron, and cinchona, and removal to a non-malarious climate. Prophylaxis is that of malaria —the use of the mosquito net, the habitual use of quinine 5 gr. daily.

Steinen[9] has used **Nucleogen** with good results in the treatment of malaria, both in acute and chronic cases, and also prophylactically.

Poirier[10] recommends **Aristochin** instead of quinine in treating children for malaria.

Kütz[11] lays stress on the fact that absence of malarial parasites from the circulation does not necessarily involve the diagnosis of non-malaria. He discusses those conditions in which clinically there is no doubt as to the case being malaria, yet parasites are absent: (1) In acute malaria of the adult native with characteristic fever curve, clinical symptoms, and prompt response to quinine, the author finds parasites in only half the cases. (2) In larval or chronic malaria of

natives. This form occurs chiefly in those who are resident in a particular locality, while the acute form occurs in those whose immunity is destroyed by change of locality, e.g., from hot to cold districts. (3) A third category is formed by those Europeans who have undertaken a quinine prophylaxis in an insufficient way. Not uncommonly a large dose of quinine may make the blood-examination negative, but yet the fever is severe. (4) Blackwater cases form a fourth group. The author in sixteen cases of blackwater found parasites only in three cases, and indeed only a few parasites after examining several slides. Among the thirteen negative two had been examined before the attack of blackwater, but these were also negative. The eleven other negative cases were first examined on the first or second day after the attack. The author is struck by the absence of parasites in cases of blackwater following upon fever with typical temperature chart. (5) The fifth group of cases is those in which parasites are found on the first day of the fever, but disappear after the first dose of quinine without a concomitant di-appearance of symptoms. As is not uncommonly the case, these patients have already taken quinine, so that in spite of the typical malarial symptoms, it is impossible to find parasites. The author points out that in Europe there is no difficulty in finding parasites in cases of malaria, but that this is not the case always in tropical Africa in malignant tertian fever is well known to those who have worked there.

E. Bellet[12] bases his treatment of blackwater fever on the observations of Vincent, viz., that **Calcium Chloride** in a dose of 4 to 6 grams (1 gram=15 gr.) per ounce, or 1 to 2 grams in normal saline solution, given subcutaneously, can arrest the hæmoglobinuria, and given in preventive doses can check the onset of blackwater after the administration of quinine. The drug was administered in the following way :—

℞	Calcium Chloride 4 grams Syr. d'Ecorces d'Or. Amères (bitter orange) 30 grams	Infusion de Tilleul (*Tilia Europæa*)	120 grams

A tablespoonful every hour.

If there is gastric intolerance, as commonly is the case, to the above add 40 grams of saturated chloroform water. If the vomiting persists, the drug should be given as a rectal injection, to the extent of 6 to 8 grams in twenty-four hours. In two very severe cases the drug was given subcutaneously in the following way :—

℞	Calcium Chloride 4–5 grams Sodium Chloride 10 grams	Distilled Water	1000 grams

100 to 200 cc. of this solution are injected two or three times in twenty-four hours. As regards general treatment, the author recommends the use of a **Mild Purgative**—castor oil or citrate of magnesia—instead of calomel, which irritates the kidneys. **Rectal Injections** of salt solution (15 parts per 1000) with some calcium chloride added, should be frequently given. **Dry-cupping** over the hepatic and renal regions and

absolute rest in bed should be enforced. As a drink, milk is advised, and plenty of diuretic drinking mixtures. The skin should be rubbed with warm vinegar, or alcohol solutions, followed by dry friction. As regards quinine, the author gives the **Hydrochlorate** in doses of about half a gram. The hæmolytic effect is checked by the **Calcium Chloride** also administered. During convalescence he gives 5 gr. daily of the hydrochlorate.

REFERENCES.—[1]*Lancet*, Nov. 9, 1908 ; [2]*Ibid.* Sept. 29, 1907 ; [3]*Brit. Med. Jour.* Oct. 19, 1907 ; [4]*Ibid.* ; [5]*Berl. klin. Woch.* Oct. 28, 1907 ; [6]*Ind. Med Gaz.* Feb. 1908 ; [7]*Ibid.* ; [8]*Brit. Med. Jour.* Nov. 9, 1907 ; [9]*Reichsmedizinalanzeiger*, Nov. 22, 1907, in *Arch. f. Schiffs u. Trop. Hyg.* 1908, p. 581 ; [10]*Province méd.* 1907, No. 31, in *ibid.* ; [11]*Arch. f. Schiffs u. Trop. Hyg.* 1908, No. 8 ; [12]*Bull. de la Soc. de Path. Exotique*, 1908, No. 7.

MALTA FEVER. *J. W. W. Stephens, M.D.*

C. Birt[1] calls attention to some features of this fever : (1) It is often unaccompanied by marked symptoms ; (2) Constipation is frequent ; (3) Lumbar and sciatic pains are not uncommonly severe ; (4) Sweating is marked ; (5) Swellings of joints, bursæ, and of the sheaths of tendons, neuritis, and orchitis may occur. Agglutination of *M. melitensis* by a serum diluted twenty times is regarded by the author as diagnostic of Malta fever. To ensure the accuracy of this result the cultures should be grown on glucose-nitrose-agar acid to the extent of 25 on Eyre's scale. Emulsions of such cultures, even if the coccus has been growing for a year in the laboratory, are not affected at all by normal serum (diluted twenty-fold). Further, the author prefers emulsions heated to 55° C. for one hour, with the addition of 0·5 per cent phenol. In chronic cases, good results have been obtained by subcutaneous inoculation of small doses of *M. melitensis* vaccine.

W. F. Brayne[2] records twenty-six cases of Malta fever amongst the Sikhs at Rawalpindi (India), and further, some of the goats there were also found to be infected.

D. Mackenzie,[3] in the diagnosis of Malta fever, lays stress on the following points :—

(1). *Enteric.*—Pyrexia and a *clean* tongue, with a history of several weeks' illness, together with fleeting pains, suggest Malta fever.

(2). *Pneumonia.*—Pulmonary congestion may lead to an error of diagnosis, as this is often present in acute cases of Malta fever, or the pneumonia may be a complication ; in this case the serum test is the most reliable.

(3). *Malaria.*—The occurrence of rigors and the action of quinine exclude this disease.

(4). *Tuberculosis.*—In Malta fever there may occur a pulmonary affection—râle and cough. The examination of the sputum for tubercle bacilli should decide.

TREATMENT.—**Liq. Strychninæ** and **Spt. Æth. Nit.** mitigate the symptoms. For the swollen joints, **Liq. Iodi. Fort.**, **Blisters**, and **Hot Fomentations** sometimes are of great use.

Eyre,[4] in the Milroy lectures, deals with this fever in all its aspects.

As regards the symptoms, the most important, and in fact the only one that is practically constant, is the repeated alternation of pyrexial attacks with periods of normal or nearly normal temperature. The onset may be acute, with rigors, severe headache, pains, etc; subacute, with gradual onset, and then a steady and gradual rise of evening temperature with morning remissions, followed by a similar and gradual fall; or ambulatory, with practically no symptoms, but the patient's blood gives a specific agglutination. As regards the various systems of the body the following are noteworthy:—

Alimentary.—The liver is often enlarged and the spleen is generally palpable.

Nervous.—Neuritis of the sciatic nerve is common, and it is acute. Cutaneous and deep reflexes are usually increased.

Circulatory.—The red cells may fall to three millions or less. There may be a leucopœnia or leucocytosis. The increase affects mainly the non-granular cells (*cf. infra*).

Articular.—Effusion into joints are not uncommon, and occasionally into tendon sheaths.

Generative.—Orchitis and epididymitis are not uncommon.

Hyperpyrexia and cardiac failure are the only serious complications.

The agglutination reaction is of importance in Malta fever, especially in chronic cases of fever of unknown origin, where the diagnosis is doubtful. The blood reacts from about the fifth day onwards, but the reaction may be delayed for weeks. The reaction is usually given in dilutions of 1–100 or 1–1000 during the first week, and eventually dilutions as great as 1–500,000 may give a positive result. Again, a reaction of 1–50 or 1–100 may be given up to ten years after an attack. Normal sera tested with *M. melitensis* never react properly, even in a dilution of 1–10. The reaction may be carried out in two ways: (1) Macroscopic; (2) Microscopic.

1. *Macroscopic Test.*—The emulsion of cocci and diluted serum is aspirated into a capillary tube. One end is sealed, and the tube is allowed to stand for twenty-four hours. A similar mixture of cocci and normal serum or saline solution is made for comparison. At the end of the twenty-four hours this latter tube is still turbid, whereas the other, if the reaction is positive, is perfectly clear, the cocci being all agglomerated at the bottom.

2. *Microscopic Test.*—The mixture is made in the same manner, except that now a drop of the emulsion is put up as a hanging drop. The author takes as his standard a positive reaction in a dilution of 1–30 to 1–50 within half an hour. The following precautions must be taken: (*a*) The serum should be clear and free from red cells; (*b*) The culture of *M. melitensis* should be one recently isolated or recently passed through an animal, and grown on agar of + 10 reaction (Eyre's scale), and not older than two or three days. The necessity for this is that old laboratory cultures are inclined to agglutinate automatically when mixed with saline or normal serum, so that the culture used should always be tested; (*c*) Moreover, it is necessary to prepare a

series of dilutions and not simply one, e.g., 1–30 or 1–50, for the following reasons: A serum may clump *M. melitensis* in dilutions of 1–30, 1–40, 1–80, but not in a dilution of 1–50; or, again, it may clump in dilutions of 1–50 to 1–500, but not in dilutions of 1–10 or 1–20; or, again, a reaction may be negative in each dilution up to 1–100, but positive in 1–200. This peculiar phenomenon, which is well recognized, but the explanation of which is not clear, makes it necessary, as stated above, to use a series of dilutions.

The author then deals with the mode of infection, and shows how Zammit, a member of the Mediterranean Fever Commission, 1904–1906, was led to his discovery that goats naturally infected with *M. melitensis* were fairly common. The bearing of this discovery and the results in prophylaxis accruing from it have been dealt with in previous years.

A. Tomaselli[5] publishes the results of blood-counts in fourteen cases of Malta fever, some of a few weeks', others of several months' duration. Leucopœnia was well marked in several cases, but leucocytosis was not recorded. As far as regards the relative count there was observed not uncommonly an increase of lymphocytes at the expense of polynuclear leucocytes.

References.—[1]*Brit. Med. Jour.* Nov. 9, 1907; [2]*Ind. Med. Gaz.* Dec. 1907; [3]*S. Afr. Med. Rec.* Feb. 25, 1908; [4]*Lancet*, June 20, 1908; [5]*Il. Policl.* June, 1908.

MARASMUS, INFANTILE. (*See also* Infant Feeding.)

Prof. G. F. Still, M.D., F.R.C.P.

The present writer[1] points out that the marasmus of infants is a symptom rather than a disease, and may be due to many different causes. Digestive difficulty is no doubt the commonest, but by no means the only, cause of wasting in an infant. The fault may be in the food; insufficient dilution of milk is a specially common cause of indigestion and wasting. As a sort of working standard the following proportions are suitable:—At three months: milk and water, equal parts. At six months: milk two parts, water one part. At nine months: milk three parts, water one part. Any considerable departure from these proportions may result in wasting. Excessive cream may cause nutritional disturbance, so also may deficiency of cream. The fat percentage should be not below 2 per cent, and not above 3·5 per cent. Excess of carbohydrate, whether sugar or starch, is likely to affect nutrition. Condensed milk is responsible for many cases of marasmus in hospital practice, usually owing to excessive dilution of the milk; for instance, to one infant it was being given in the proportion of 4 teaspoonfuls to 2 pints of water, which would yield a mixture containing: proteid ·5 per cent, fat ·7 per cent, sugar 2·75 per cent; in other words, nothing more than a weak solution of sugar.

The fault may be in the manner of feeding; it may be too frequent, or irregular, or the size of the feeds may be too large. But the cause of the marasmus may be in the infant himself; the powers of assimilation in rare cases seem to be unnaturally short-lived, so that the child comes to the end of them soon after birth.

Some infants seem to be born with a peculiar idiosyncrasy, so that they are unable to digest certain elements of food ; it may be fat, or proteid, or carbohydrate ; and obviously, if the inability extends to any two of these elements of diet, nutrition will be extremely difficult, if not impossible. Marasmus is very common after diarrhœa, possibly owing to fibrotic changes in the mucosa destroying the absorptive function in certain areas of the bowel. Congenital syphilis is always to be remembered as a cause of marasmus ; it may easily be overlooked, for it may be the only manifestation for some time. A cause of infantile marasmus, which is often overlooked, is chronic constipation. Congenital heart disease may also cause much interference with nutrition, even when there is no cyanosis. Tuberculosis is comparatively seldom a cause of wasting in the first year of life, and under the age of six months it is rare.

Thompson[2] draws attention to atrophy of the parathyroid glandules in primary infantile atrophy. It is well known that the thymus gland is usually wasted more or less in infants who have died of marasmus. It seems natural enough that the various glandular structures, including the parathyroid and the thymus, should suffer some atrophic or degenerative changes in advanced marasmus. Thompson, however, does not produce any proof that the changes in these glands are primary.

As Garrod[3] points out, conspicuous wasting is a constant symptom of so-called congenital hypertrophy of the pylorus in infants ; and there can be little doubt that until recently such cases were sometimes mistaken for simple marasmus, as the vomiting may not be very frequent.

Treatment.—Where marasmus is due to digestive disorders a weak food is usually required, such as **Veal** or **Chicken Broth,** with milk sugar ; and after a few days some weak peptonized milk may alternate with the broth. **Asses' Milk** is often of great value in infantile marasmus. Sometimes **Dried Milk** succeeds well in these cases.

Fat is often ill tolerated, especially in the form of cream. **Buttermilk** has been advocated for cases of marasmus by Carpenter,[4] of Philadelphia. Simpson, of Edinburgh, recommends **Thyroid Extract** in doses of $\frac{1}{3}$ to $\frac{1}{2}$ gr. (Burroughs & Wellcome's tabloids) three times a day to infants under a year old.

Malt is often more useful to these wasted infants than cod-liver oil ; the malt may be used to sweeten the food. **Warmth** is very important ; for a very young infant with marasmus an **Incubator** may be useful. Inunction of oil is often used, and at least helps to maintain the warmth of the infant.

Where there is any suspicion of syphilis, **Grey Powder** should be given, for although some such cases do not respond to mercury, others recover rapidly under its influence.

References.—[1]*Med. Press*, June 3, 1908 ; [2]*Amer. Jour. Med. Sci.* Oct. 1908 ; [3]*Clin. Jour.* Sept. 26, 1906 ; [4]*Lancet*, Oct. 5, 1907.

MASTOID DISEASE. (*See* Ear, Diseases of.)

MEASLES. *E. W. Goodall, M.D.*

The writer[1] has drawn attention to the fact that in some of the acute infectious diseases certain febrile and other symptoms may appear at the time of infection; but in his experience such cases are not common. E. Ward, however,[2] believes that in measles their occurrence is not infrequent; he estimates the frequency at 5 to 10 per cent. He also states that occasionally these early symptoms do not subside, but continue off and on till the eruption makes its appearance. He gives a short account of cases of this nature which were observed by him in a series of 100 cases occurring during an epidemic. He noticed that in several there was a general enlargement of the glands before the rash came out. He draws attention to another clinical fact which is often forgotten, namely, that the rash of measles may first appear on the buttocks. According to Ward, patients in whom the rash comes out slowly are more likely to have a severe attack than those in whom it appears quickly and profusely; and usually a profuse eruption of Koplik's spots precedes a profuse skin eruption. The finer the type of rash the more severe the disease. In the cases where the lung signs were extensive in both lungs, even with dyspnœa and slight cyanosis, at an early period of the disease, recovery usually took place.

REFERENCES.—[1]*Brit. Med. Jour.* Aug. 1907; [2]*Ibid.* May 30, 1908.

MELANOMATA, SURGICAL TREATMENT OF.

E. Graham Little, M.D., F.R.C.P.

Melanoma is here defined as a tumour containing melanin—the natural pigment of the skin,—and two classes of tumour are recognized, the innocent and malignant. The innocent melanomata are of congenital origin, or appear in early infancy, and are all included in the term "nævi," as used by Continental authors, as synonymous with "a congenital malformation of a localized area of the skin." Histologically, a layer of richly protoplasmic polygonal non-pigmented cells is found lying in the upper part of the corium immediately below the epidermis, from which the cells are often separated by a fibrous zone. These have been called "nævus cells," and are regarded by the author as embryonic *chromatophores*—the name given to the pigment cell containing melanin, found in normal skin. Much diversity of opinion, however, exists as to the true nature of these nævus cells. The treatment of simple melanomata as prescribed by Handley, may be summed up in two rules: "Caustics should never be applied to them, and the tumour should never be cut into." They are generally best left alone, unless in position where they are a great disfigurement, or where irritation or friction of the surface is probable; in these cases they should be excised, and this procedure must always be adopted when the nævus ulcerates, or displays a tendency to enlarge, or bleed from the surface. For the simple melanoma may become malignant, and the second group, the malignant melanomata, is defined as comprising two classes: (1) Those arising from pre-existing simple melanomata;

(2) Implantation melanomata. The latter occur after injury or operative procedures, and the suggestion is made by this author that they are due to the implantation of chromatophores by the injury, as in the case of implantation-cysts described by Bland-Sutton. These tumours, and their metastases as well, are usually deeply pigmented. The enlargement of glands in connection with a pigmented tumour is one of the most certain criteria of their malignancy; when any doubt exists as to malignancy, the tumour should be excised. The spread of malignant melanoma probably takes place by permeation of the lymphatics of the skin; hence the lymphatic glands are involved early, and no operation is complete which does not include the removal of these regional lymph-glands. When the tumour is on the border line between two sets of lymphatics, both will probably be involved, and the glands in both sites will have to be removed. The blood-stream becomes occupied later by extension from the lymphatics to the perilymphatic venules, and then dissemination of the growth increases with great rapidity.

Operation for melanomata which have become malignant must be undertaken with all these facts carefully kept in mind. The skin incisions should be at least an inch beyond the margin of the tumour. The subcutaneous fat and deep fascia should further be removed for at least two inches beyond the skin incision, since the area of permeation of the deep fascia is always wider than the area of skin involved. The lymphatic glands in relation with the growth must in every case be excised, and with the same precaution of removing with them large areas of the deep fascia surrounding them.

Reference.—Handley, *Clin. Jour.* Nov. 20, 1907.

MÉNIÈRE'S DISEASE. (*See* Vertigo.)

MENINGITIS, CEREBROSPINAL. (*See* Cerebrospinal Meningitis.)

MIGRAINE.

(*Vol.* 1906, p. 11)—Pills containing gr. ½ of an alcoholic extract of **Cannabis Indica** will, it is said, prevent the occurrence of attacks. One pill at bedtime should be given at first; if this fails, two pills should be taken at bed-time for half the month, and one pill only on each remaining day. The treatment should be persisted in for a long time.

MILK DYSPEPSIA OF INFANTS.

(*Vol.* 1907, p. 11)—For infants unable to digest cow's milk, **Sodium Citrate** is valuable. One or two grains (according to the severity of the case) should be added to each ounce of milk. This leads to the formation of a looser clot in the infant's stomach. It may be prescribed in the following way: ℞ Sodii Citratis gr. iij or vj, Spt. Chloroformi ℥ij, Aq. ad ℥j: a teaspoonful to be added to each feed (supposing that each feed contains three ounces of milk).

MUMPS. *E. W. Goodall, M.D.*

Perhaps more frequently than is supposed, the sole local manifestation of this disease may be *orchitis*. Often there are a high temperature and marked nervous symptoms, especially delirium and prostration. Several cases of the kind have been described recently by O. E.

Higgens,[1] W. H. Maidlow,[2] and F. Walsh.[3] In three patients observed by Walsh, atrophy of the organ followed.

Wilfred Edgecombe,[4] in a paper entitled "Metastatic Affection of the Pancreas in Mumps," states that in an outbreak of thirty-three cases of mumps that he observed in a boys' school, there were five cases in which the symptoms pointed to involvement of the *pancreas*. The best marked case was that of a boy aged 11, who on the sixth day of his illness, which up to that time had been very mild, complained of feeling sick. Next day there were vomiting and pain and tenderness in the epigastrium. On the eighth day the vomiting was incessant, even water in sips being rejected; the vomit contained bile and viscid, ropy mucus. The submaxillary glands were swollen. There was epigastric pain, but it was not severe. There was a tender swelling to be felt lying transversely in the epigastrium and left hypochondrium. The boy gradually recovered. The patient's brother, aged 9, presented similar, though not quite such severe, symptoms. In the other three cases no swelling in the epigastrium could be felt, but there was vomiting, with epigastric pain. In the case of the younger of the two brothers, P. J. Cammidge reported of a specimen of urine that it showed a well-marked pancreatic reaction, indicating inflammation of the pancreas. The paper contains a list of references to writings on the subject.

References.—[1]*Brit. Med. Jour.* Ap. 18, 1908; [2]*Ibid.* Ap. 25, 1908; [3]*Ibid.* May 30, 1908; [4]*Pract.* Feb. 1908.

MUSCULAR "FIBROSITIS."

(*Vol.* 1905, p. 396)—Gower advises free **Diaphoresis** (e.g., a Turkish bath) at the very outset of the attack, with rest and hot fomentations. Internally he prescribes **Colchicum, Nitrous Ether,** and **Citrate of Lithia** in the acute stage, and **Saline Aperients.** In more chronic cases stimulating liniments and gentle **Faradism** are recommended. In obstinate cases **Counter-irritation** (even by the actual cautery) is useful, with deep daily local injections of **Cocaine** for two or three weeks. This treatment is applicable to lumbago, pleurodynia, and other varieties of the malady.

MYCOSIS FUNGOIDES.

E. Graham Little, M.D., F.R.C.P.

Alex. Garceau[1] describes a new case of mycosis fungoides which occurred in his practice in San Francisco some months before the earthquake and fire which destroyed that city. The patient was a widow woman, aged 26. The disease had commenced four years previously with a single intensely itchy patch, from which a general erythematous and scaly eruption had slowly spread, until the thorax, abdomen, and flexor and extensor surface of arms and legs were almost entirely covered. The patient improved markedly with **X-ray** treatment during the period from February to April, 1906; the objective symptoms had in fact almost entirely disappeared. She was not seen again until after the double catastrophe to the city, in which she had suffered great shock and financial loss. At this time multiple tumours had developed, and there was general scaling and intense itching. X-ray treatment was again attempted, but now appeared to aggravate the tumour formation. It was also noted that

the performance of a biopsie seemed to produce a serious metastatic extension of the disease, an observation also recorded by Marsh. The patient subsequently died two years after coming under observation.

REFERENCES.—[1]*Brit. Med. Jour.* Oct. 24, 1908 ; [2]*Ibid.* Oct. 10, 1908.

MYIASIS. *J. W. W. Stephens, M.D.*

F. C. Wellman[1] records a case of intestinal myiasis with dysenteric symptoms due to the larvæ of Anthomyidæ and Sarcophaga ; 18 and 21 larvæ were passed after doses of castor oil. The larvæ hatched out into flies in about a fortnight.

REFERENCE.—[1]*Arch. f. Schiffs u. Trop. Hyg.* in *Jour. Trop. Med.* June 1, 1907.

MYOMATA. (*See* UTERUS, DISEASES OF.)

NASAL ACCESSORY SINUSES, DISEASES OF. *William Milligan, M.D.*
D. Lindley Sewell, M.B.

In the diagnosis of suppurative disease of the maxillary antrum, attention should be directed to ascertaining, if possible, the exact route of infection. Cases may be divided into two main classes : (1) Those of dental origin ; (2) Those of nasal origin. The presence of carious molars in a case of antral suppuration does not by any means prove that the route of infection is through the alveolus, nor on the other hand do the presence of healthy molars exclude the dental origin of antral disease. K. W. Goadby[1] points out that antral suppuration may occur from alveolar infection without the intervention of carious teeth. In cases of alveolar pyorrhœa masses of granulation tissue seen on extracted teeth show on section a process of rarefying osteitis spreading into the bone, while the tissue farthest away from the advancing inflammation shows fibrous sclerosis. Cases of nasal origin are common after attacks of epidemic influenza, and occur also during the course of the exanthemata. Treatment should, so far as is possible, be based upon the exact etiology of the disease and the route of infection chosen as the route of operation ; in other words, the path of infection should be opened up and followed.

The tendency to operate through the inferior meatus and to provide permanent drainage into the corresponding nasal passage is a growing one. Harmon Smith,[2] in discussing the advantages of the nasal route, recommends the following plan of procedure :—The mucosa over the anterior half of the inferior turbinal and floor of the nose is anæsthetized by an injection of cocaine and adrenalin. The anterior half of the inferior turbinal is then removed (*Fig.* 80). A flap of mucous membrane is now detached over an area corresponding with the site of proposed entrance into the sinus, by cutting two vertical and parallel lines, the first from a point just anterior to the cut end of the inferior turbinal downwards to the floor of the nose, and the second about half an inch farther forward and parallel to the first. These two incisions are connected by a horizontal cut at their upper extremities. With a small elevator the flap of mucous membrane is reflected down-

wards and turned on to the floor of the nose. The antrum is then entered and the opening enlarged by a bur. After cleansing, the mucous membrane flap is folded inwards into the antrum and kept in position by strips of packing. In the event of a more radical operation, e.g., the Caldwell-Luc, having to be subsequently performed, good intranasal drainage will have already been secured.

K. W. Goadby (*loc. cit.*) calls attention to treatment founded upon the bacteriological examination of the discharge. He advocates **Immunization** by means of vaccines, starting with an appropriate stock vaccine, and when necessary with a vaccine prepared from the

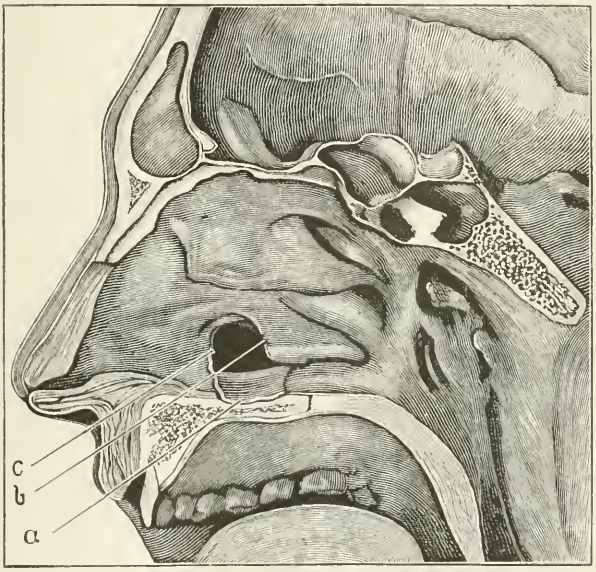


Fig. 80.—*a*, The flap of mucous membrane detached from the lateral wall of the nasal chamber under the inferior turbinate; *b*, the remaining portion of the inferior turbinate after the removal of the anterior third; *c*, the approximate size of the opening into the antrum Highmori necessary to evacuate the products of chronic suppuration.

patient's own organisms. The results of immunization treatment proved satisfactory, the anæmia and toxæmia disappearing, and marked relief to persistent headache being afforded. Free drainage of the infected cavity is essential.

The perfection attained in taking **X-ray Photographs** has induced many observers to utilize this method as a means of diagnosis. Goldman and Killian believe it to be of great value in the detection of diseased conditions of the frontal and ethmoidal sinuses, more especially of the anterior ethmoidal cells. In cases of posterior ethmoidal and sphenoidal suppuration, they have found it to be of no value whatever. Sinclair Tousey[3] finds that lateral radiographs

are easier to make and more intelligible than those made antero-posteriorly. For a lateral radiogram an exposure of fifteen seconds with a primary current of eighteen ampères is sufficient. The anti-kathode should be placed 17 in. from the plate.

Frontal Sinus Suppuration.—The difficulties encountered in successfully dealing with chronic frontal sinusitis by external operation have induced various observers to endeavour to drain the sinuses by intranasal methods, e.g., removal of the anterior end of the middle turbinal, trephining the floor of the sinus, etc. With the aid of the fluorescent screen, such intranasal procedures have been rendered comparatively safe. The results, however, have not always been very encouraging, on account of the impossibility of dealing successfully with the diseased mucosa lining the sinus or sinuses.

Dundas Grant[1] advocates the use of bougies for the dilatation of the infundibulum. For the purpose he has devised a series of six metal bougies curved like Hartmann's frontal sinus cannula and graduated in millimetres. After cocainization and drying of the mucosa, the smallest of the bougies is moulded to the proper curve (ascertained by the previous introduction of a flexible probe) and introduced into the sinus, followed by larger and larger bougies until good dilatation is effected, after which a large sized cannula can be used to wash out the sinus.

The Relation of Disease of the Accessory Nasal Sinuses to Diseases of the Eye.—At the Sheffield meeting of the British Medical Association a discussion upon the above subject was introduced by A. Logan Turner and George Mackay. The intimate relation of the various sinuses to the orbital contents was drawn attention to, and the advisability of co-operation between the ophthalmic surgeon and the rhinologist in clinical work insisted upon.

Mucocele of the Accessory Nasal Sinuses.—A. Logan Turner,[5] in discussing the treatment of cases of frontal or ethmoidal mucocele, advocates as a general rule the adoption of an external operation. One of two methods should be chosen: either to open the sinus and obliterate its cavity without attempting to make any communication with the nose, or, after opening the sinus, to establish a large communication with the corresponding nasal passage, so that a permanent vent is secured. Of the two methods he prefers the second. After having enlarged the natural ostium, or after having made a new passage, he inserts a rubber drainage tube with a collar and draws it down into the nose. The sinus is then lightly packed with gauze, which is brought out through the inner end of the external incision. The gauze is removed at the end of four or five days, the cavity syringed, and if the drainage tube is found to work satisfactorily the external incision is allowed to close. The sinus is subsequently irrigated each day by introducing the fine nozzle of a syringe into the nasal end of the drainage tube.

REFERENCES.—[1]*Brit. Med. Jour.* Aug. 22, 1908; [2]*N.Y. Med. Jour.* Mar. 28, 1908; [3]*Ibid.*; [4]*Brit. Med. Jour.* Sept. 26, 1908; [5]*Edin. Med. Jour.* Dec. 1907.

NASAL ACCESSORY SINUSES. *P. Watson Williams, M.D.*

It is not intended here to give a systematic description of the anatomy of the nose and nasal accessory sinuses, but to draw attention to various important points having a direct bearing on the clinical aspects of accessory sinus suppuration and other pathological conditions arising in the nose, and more particularly to illustrate the relationship between diseases in these regions and ocular and intracranial complications. In previous issues of the *Medical Annual* (1907–08) stereoscopic illustrations were given of operations on the maxillary antrum and the radical operations of Prof. Killian, Prof. Delseaux, and of the writer, for pansinusitis, and in continuation of that series some stereoscopic plates showing other accessory sinus operations are included here.

The external wall of the normal nose, with a section of the frontal sinus, ethmoidal cells, and sphenoidal sinus, is shown in *Plate XXXI*, which will serve to recall the normal anatomical structures to those of our readers who are not very familiar with this region. Below is the inferior turbinal body, separated from the middle turbinal above it by the middle meatus, while above the middle turbinal are seen ethmoid cells in section, and behind the latter the sphenoidal sinus. Instead of removing the middle turbinal to show the underlying structures on the outer wall of the middle meatus, a semicircular window has been cut out of it, displaying a normal-sized ethmoid bulla, and in front of it the unciform process. Between the bulla and this process is the unciform groove or hiatus semilunaris, passing upwards to the fronto-nasal duct leading to the frontal sinus, which extends well up into the forehead, the small portion of the right sinus extending above the left frontal sinus. One cannot fail to note how extensive and how close is the relationship between these sinuses and cells to the base of the frontal lobes, while behind the left optic nerve crosses directly above the left sphenoidal sinus, to enter the optic canal and so reach the left ocular bulb.

The same structures are seen in the transverse section through the nose, etc., looked at from behind (*Plate XXXII*), which also includes the orbital fossæ and maxillary antra. The relation of the ethmoid cells to the orbit, of which they form, to a large extent, the inner wall, is displayed. In this preparation one antrum is unusually small, the other exceptionally large ; such bilateral asymmetry is relatively common, and is seen in several of the other figures of transverse sections of the skull.

Encroachment by the ethmoidal cells in the territory both of the frontal and sphenoidal sinus is shown in *Plate XXXIII*. The extent to which the anterior ethmoidal cells may develop anteriorly over the orbit and come forward so as to take the place, partially or entirely, of the true frontal sinus, is illustrated in *Plate XXXIV*. Here the true frontal sinuses are quite small and ill-developed, while the ethmoidal cells are very large and look like frontal sinuses from their size and position. A somewhat analogous over-development

of the posterior ethmoidal cells is shown in section in *Plate XXXV, Fig. A*, where the sphenoidal sinus has been encroached on, so to speak, by an ethmoidal cell; consequently the body of the sphenoid is mainly occupied by the ethmoidal cell, which overlaps the diminutive true sphenoidal sinus. This partial replacement of the sphenoidal sinus is perhaps more remarkable in *Plate XXXV., Fig. B*, which represents a condition that has been erroneously described as an upper and lower sphenoidal sinus. This tendency for the posterior ethmoid cells and sphenoidal sinus to vary in degree of development results in variable relationships to the optic canal which merit fuller consideration.

It is unnecessary here to recall the well-known fact that suppuration in the sphenoidal sinus may lead to blindness from involvement of the optic nerve sheath. The examples of Prof. Onodi's plates illustrating the relations of the optic nerve to the sphenoidal sinus (*Plates XXXVI and XXXVII*), at once explain this clinical fact, and show how optic neuritis, blindness, etc., may equally be due to suppuration in posterior ethmoidal cells (*Plate XXXVIII*). Further, some of the plates show that the sphenoidal sinus of one side and the ethmoidal cell of the other may form in part the wall of the optic nerve canals (*Plate XXXIX*), or again, that the cavity, either ethmoid cell or sphenoidal sinus of one side may be in direct relationship with the opposite, or with both optic nerves (*Plates XL to XLII*). These examples are particularly valuable as affording anatomical explanations of the occurrence of contra-lateral blindness in unilateral nasal sinus suppuration—in other words, of left-sided sinus suppuration causing right-sided blindness, etc. These plates and, perhaps even more forcibly, *Plate XXXIII*, will serve to bring home the danger of "freely curetting" the ethmoidal cells, a practice sometimes advocated as though devoid of special risk. Instances of blindness in one eye following such operations have occurred, and these plates make it very obvious that the optic nerve may be injured or destroyed by curettes or cutting forceps unless due care be observed to avoid the regions in the posterior ethmoid cells or the sphenoidal sinus where the optic nerve may "lurk" in its irregular course. The points of special clinical interest, and particularly the varying relationship of the optic nerve to the accessory nasal cavities, are indicated in the descriptive lettering of the plates.

Nasal mucous polypi usually develop in the region of the unciform process in the middle meatus, and spring from relatively restricted areas even when they are so large as to fill the whole nasal passages. This is shown in a section of the nose in *Plate XLIII*. But such polypi may arise in many regions, e.g., in the upper meatus, or in any nasal accessory sinus. It is interesting to note the polypi in *Plate XLIV*, growing from the sphenoidal sinus and extending thence into the nasal passage; or in *Plate XLV*, where similar polypi are growing from the fronto-nasal duct. The latter plate also demonstrates that a frontal sinus suppuration may, and very often does, occur with abnormal patency

PLATES ILLUSTRATING CERTAIN CLINICAL ASPECTS OF NASAL ACCESSORY SINUS SUPPURATION, ETC.

P. Watson Williams, M.D.

SAGITTAL SECTION THROUGH THE LEFT NASAL PASSAGE, ETC.

Section showing the relations of the frontal sinus, ethmoidal cells, and sphenoidal sinus to the nasal passages. A window has been cut out of the middle turbinated body (10), to show the structures, etc., concealed by it and lying in the middle meatus.

1. R. frontal sinus
2. L. frontal sinus
3. Frontal lobe
4. Anterior ethmoidal cell
5. Hiatus semilunaris
6. Uncinate process
7. 8. Posterior ethmoidal cell
9. Ethmoidal bulla
10. Middle turbinate body
11. Middle meatus
12. Inferior turbinate body
13. Middle meatus
14. Inferior meatus
15. Sphenoidal sinus
16. Eustachian tube
17. Optic tract
18. Hypophysis

ONODI.

PLATE XXXII

TRANSVERSE SECTION OF THE SKULL, POSTERIOR TO CRISTA GALLI.

This preparation shows backward orbital extension of the frontal sinus on the left side; while on the right-hand side the frontal sinus has not extended so far back as the line of section. The striking feature in the preparation is the very marked asymmetry of the maxillary antra. On the left side it is small, and extends forwards further than it does on the right side, where the maxillary antrum is well developed. The elevation from the floor of antrum on the right side, produced by the upward extension of the fangs of the bicuspid tooth, is well displayed.

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SAGITTAL SECTION OF A HEAD.

Section showing the relations of the nasal accessory sinuses to the base of the brain, etc. (left side). Note especially that the optic canal traverses the sphenoidal sinus in this subject, so that rough instrumentation would involve risk of serious injury to the optic nerve, while suppuration in the sinus would probably lead to involvement of the optic nerve sheath. Observe, too, that the left frontal sinus extends well back, and that this left sinus is encroached on by that of the right side.

1. L. Optic Nerve
2. R. frontal sinus
3. R. ethmoid cell
4. L. Frontal sinus
5, 6. Ant. ethmoidal cell
7. Ethmoid bulla
8. Inferior meatus
9. Middle meatus
10. Superior meatus
11. Optic Canal
12. L. sphenoidal sinus
13. Internal carotid artery

Oxodi.

SECTION SHOWING REMOVAL OF THE ANTERIOR BLADE OF THE FRONTAL BONE OF THE SUPRA-ORBITAL REGION

The anterior walls of the frontal sinus and ethmoidal cells have been removed. On the right a very large and irregular cavity, apparently the left frontal sinus, is really a very large anterior ethmoidal cell, which has extended forward, occupying the position normally occupied by the frontal sinus: the true frontal sinuses being the two relatively small cells on the left of the middle line of the plate, while further still to the left is seen a small ethmoidal cell, lying to the right-hand or outer side of what is the true right frontal sinus. This well shows how ethmoidal cells may occupy the position normally occupied by the frontal sinus. That the large cavity which looks like the left frontal sinus was truly the ethmoidal cell was proved by the fact that there was no connection with the naso-frontal duct from this cell. The naso-frontal duct extended into the right nasal passages from the two smaller cells which have already been referred to, as right and left true frontal sinuses.

ZUCKERKANDL.

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PLATE XXXV.

LONGITUDINAL SECTIONS OF THE NOSE

Fig. A. Section to the right of the septum nasi, exposing the right sphenoidal sinus and posterior ethmoidal cell. Here the sphenoidal sinus is small and poorly developed, its normal position being occupied by a large posterior ethmoid cell: *the optic canal traverses the posterior wall of the ethmoidal cell*, while the internal carotid artery ascends behind this thin bony wall.

1. Sphenoidal sinus
2. Int. carotid
3. Optic nerve
4. Post. ethmoidal cell
5. Septum

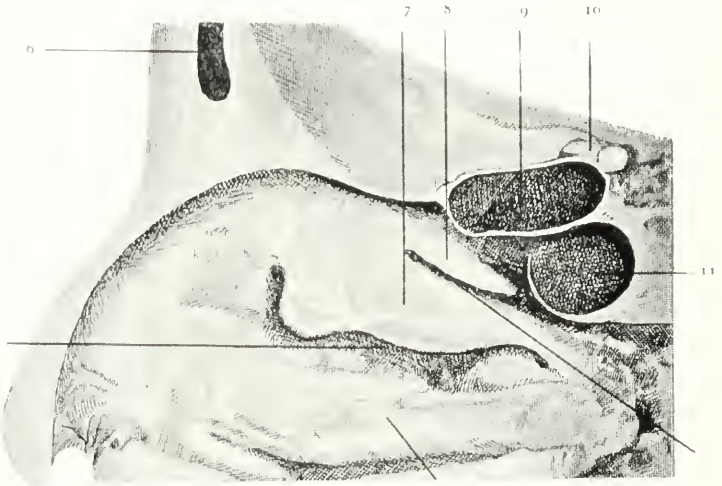


Fig. B. Section through the right nasal passages. An enormously developed posterior ethmoidal cell lies above the corresponding sphenoidal sinus, from which it is separated by a thin bony lamella, giving the condition sometimes erroneously described as double sphenoidal sinus. The optic nerve is running along the upper and posterior wall of the ethmoidal cell.

6. Frontal sinus
7. Middle turbinal
8. Superior turbinal
9. Right post. ethmoidal cell
10. Right optic nerve
11. Right sphenoidal sinus

PLATE XXXVI.

TRANSVERSE SECTION OF THE HEAD THROUGH THE SPHENOIDAL SINUSES.

Fig. A.—Viewed from behind forwards.

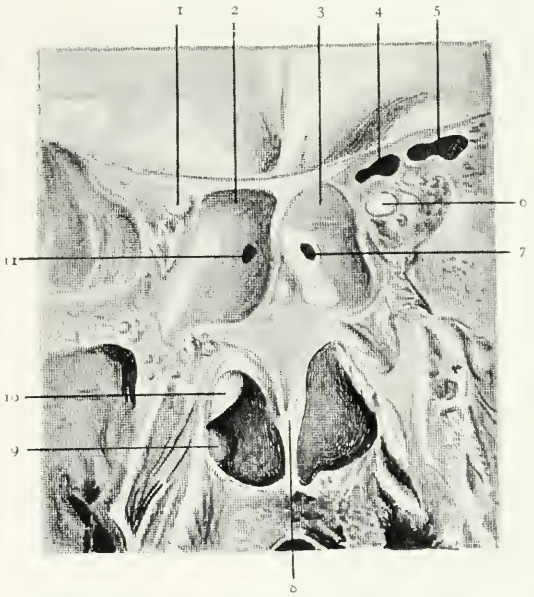


Fig. B.—Viewed from before backwards.

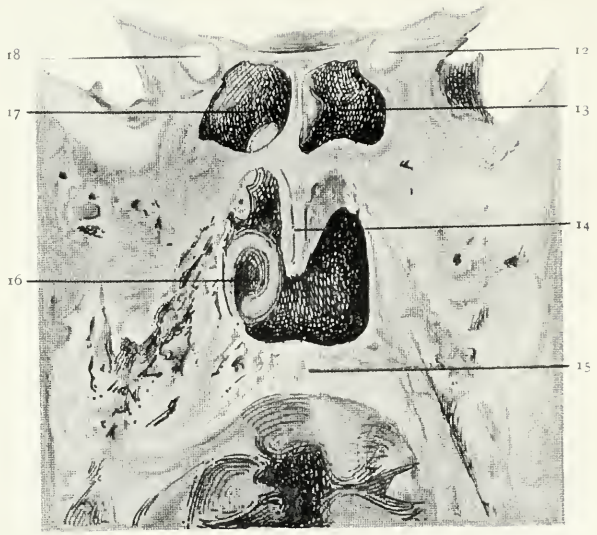
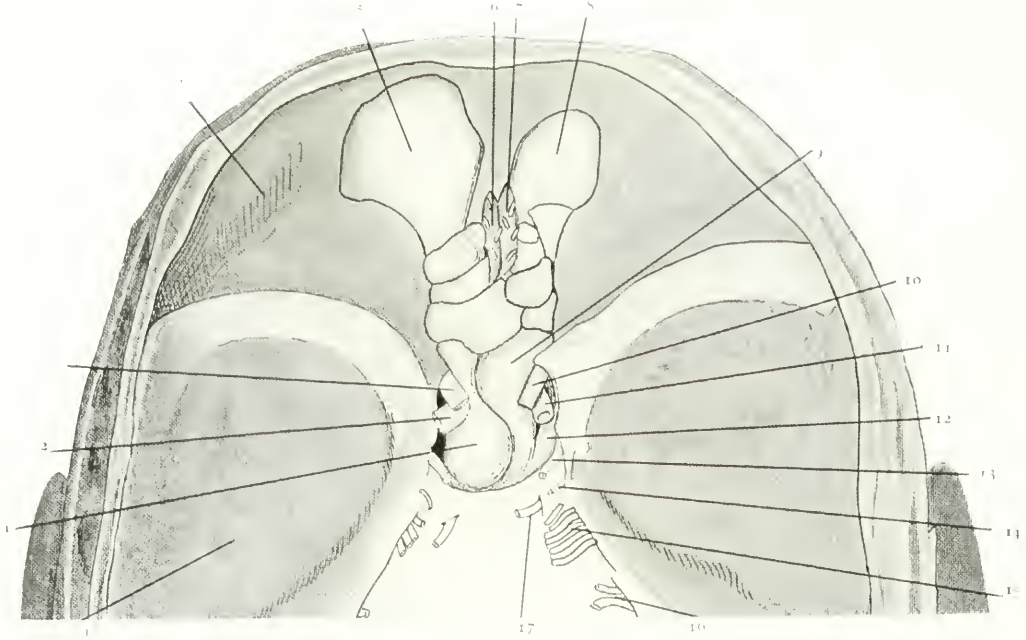


Fig. A.—The sphenoidal sinus ostia in the anterior wall are shown, and the optic nerves in normal relationship with the cavities of the sphenoidal sinuses. On the right side of this preparation the frontal sinus and the posterior ethmoid cell have extended backwards into the lesser wing of the sphenoid, the latter coming into close relationship with the right optic nerve.

1. Left optic nerve
2. Left sphenoidal sinus
3. Right sphenoidal sinus
4. Post. ethmoidal cell
5. Right frontal sinus
6. Right optic nerve
7. Ostium sphenoid. Right
8. Septum nasi
9. Inferior turbinal
10. Middle turbinal
11. Ostium sphenoid. Left
12. Left optic nerve
13. Sphenoidal sinus
14. Septum
15. Palate—below is the uvula
16. Eustachian tube
17. Sphenoidal sinus
18. Right optic nerve

THE ANTERIOR AND MIDDLE FOSSÆ OF THE CRANIAL CAVITY LOOKED AT FROM ABOVE



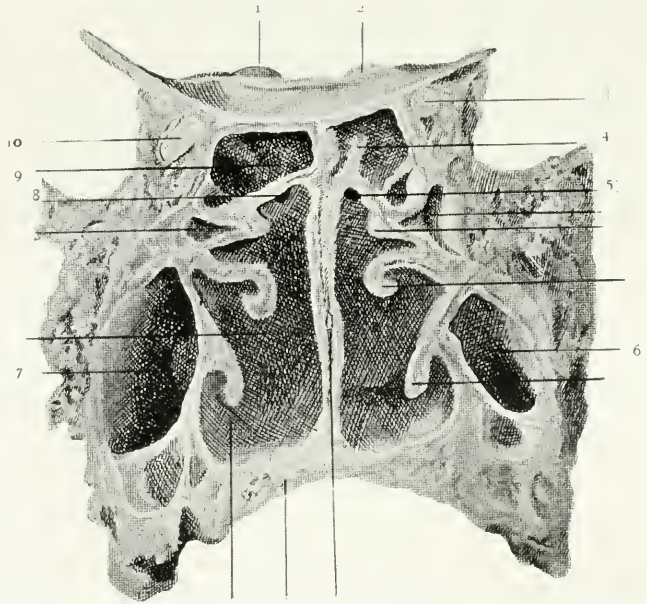
The bone covering the frontal sinuses, ethmoidal cells, and sphenoidal sinuses has been removed, as well as the sella turcica, to show the relations of these cavities to the cranial base.

1. Left sphenoidal sinus
2. Left internal carotid
3. Left optic nerve
4. Anterior fossa
5. Left frontal sinus
6, 7. Rima olfactoria
8. Right frontal sinus
9. Right sphenoidal sinus
10. Right optic nerve
11, 12. Right internal carotid artery
13. N. oculo-motorius
14. N. trochlearis
15. N. trigeminus
16. N. facialis
17. N. abducens
18. Middle fossa

ONODI

PLATE XXXVIII.

TRANSVERSE SECTION OF THE NOSE ABOVE THE LEVEL OF THE SECOND MOLAR TOOTH



On both sides the optic canal grooves the posterior ethmoid cells. The maxillary antrum on the left side is much smaller than the right in both are seen the partial transverse bony septa which so often exist, and which prevent simple flushing of the antrum being successful in curing a chronic empyema of such cavities.

1. Right optic nerve
2. Left optic nerve
3. Left optic nerve
4. Left ethmoidal cell
5. Ostium sphenoid.
6. Small left maxillary antrum
7. Large right maxillary antrum, the floor being divided by a partial transverse septum
8. Ostium sphenoid.
9. Right ethmoid cell
10. Right optic nerve

PLATE XXXIX.

TRANSVERSE SECTION BEHIND THE FIRST MOLAR TOOTH

Fig. A. Posterior portion viewed from the front

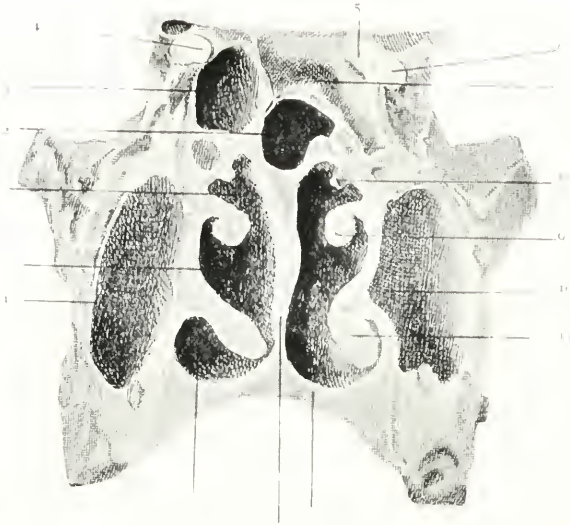
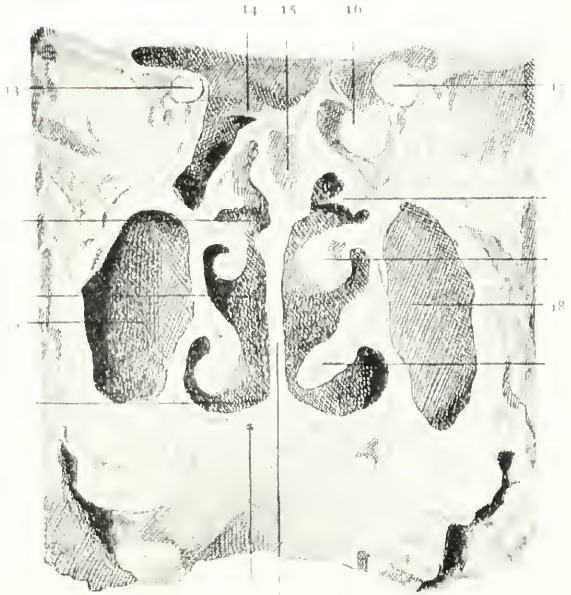


Fig. B. Anterior portion viewed from behind.

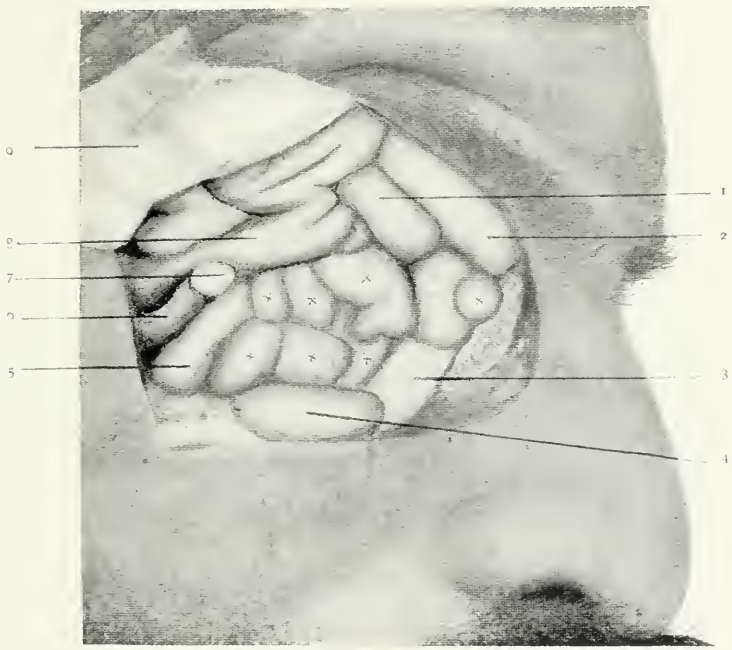


The right sphenoidal sinus is fairly normal, but the left is quite small, and almost central, being encroached on by the forward extension of a large posterior ethmoidal cell. The right optic canal traverses the upper and outer wall of the right sphenoidal sinus; but the left sphenoidal sinus is not in relation with the left optic canal, which passes across the upper and outer part of the left posterior ethmoidal cell.

1. Right maxillary sinus
2. Left sphenoidal sinus
3. Right sphenoidal sinus
4. Right optic nerve
5. Left optic canal
6. Left optic nerve
7. Left post. ethmoidal sinus
8. Superior turbinal
9. Middle turbinal
10. Left maxillary sinus
11. Inferior turbinal
12. Left maxillary antrum
13. Left optic nerve
14. Left post. ethmoidal cell
15. Left sphenoidal sinus
16. Right sphenoidal sinus
17. Right optic nerve
18. Right maxillary antrum

PLATE XL

A HEAD WITH THE ORBITAL WALLS REMOVED.



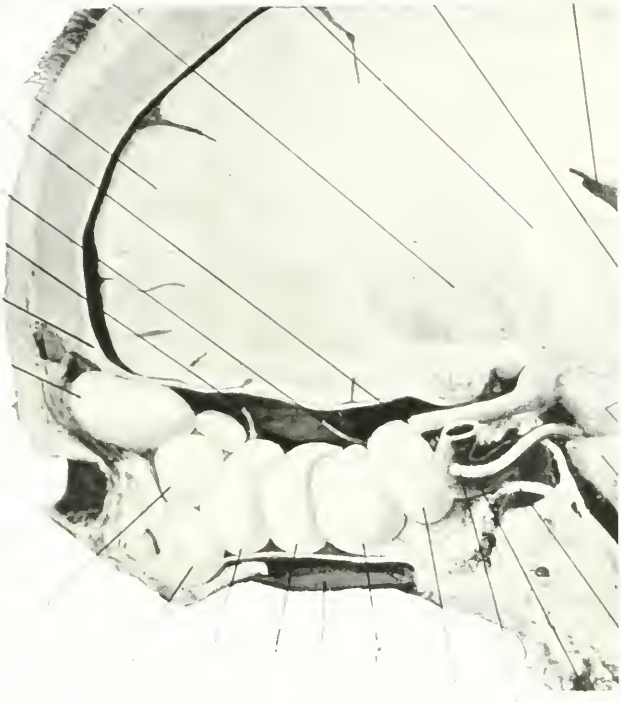
The preparation shows the relations of the roof, inner wall and floor, to the frontal lobe and optic nerve, and the nasal accessory sinuses.

1. Recessus orbitalis
2. Frontal sinus
3. Nasal cavity
4. Maxillary sinus
5. Sphenoidal sinus
6. Internal carotid artery
7. Optic nerve
8. Frontal lobe
9. Dura mater

x x x, Anterior and posterior ethmoidal cells

ONODI.

SAGITTAL SECTION OF A HEAD

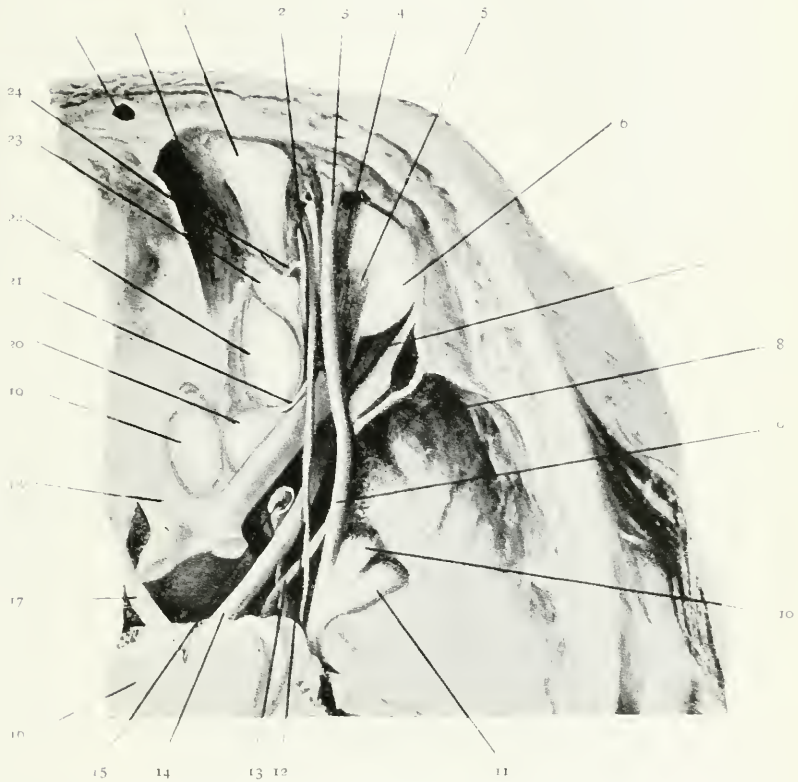


Section showing the relations of the nasal accessory sinuses to the base of the brain, and especially to the optic nerve, internal carotid artery, etc.

1. OPTIC NERVE
2. Ethmoid nerve posterior
3. " " anterior
4. Dura mater
5. Frontal sinus
6, 7, 8. Anterior ethmoidal cells
9, 10. Posterior ethmoidal cells
11. Sphenoidal sinus
12. Oculomotor nerve
13. INTERNAL CAROTID ARTERY

ONODI

THE ANTERIOR FOSSA.



The roof of the right orbit of the corresponding nasal accessory sinuses has been removed so as to display the relations of the orbital contents beneath the roof with the ethmoidal cells, sphenoidal sinus, etc.

1. R. frontal sinus
2. Superior oblique muscle
3. Supra-orbital nerve
4. Levator palpebræ muscle
5. Rectus superior muscle
6. Eyeball
7. External rectus
8. Scala media
9. Trigeminal nerve, 1st div.
10. Trigeminal nerve, 2nd div.
11. Trigeminal nerve, 3rd div.
12. Trochlear nerve
13. N. abducens
14. Oculomotor nerve, right
15. Internal carotid artery
16. Pons
17. Oculomotor nerve, left
18. Optic nerve
19. L. sphenoidal sinus
20. R. sphenoidal sinus
21. Ethmoid nerve, posterior
22. Posterior ethmoid cell
23. Anterior ethmoid cell
24. Ethmoid nerve, anterior

ONODI.

PLATE XLIII.

LONGITUDINAL SECTION OF THE RIGHT NASAL PASSAGE.

The illustration shows mucous nasal polypi growing from the uniform plate by relatively narrow pedicles: this is the site from which nasal polypi of the middle meatus most usually arise, and it will be seen that it is easy to remove such polypi by picking them off with forceps from the seat of origin, grasping the pedicles with narrow forceps, much as one would pick a pear from a tree by detaching the stem.

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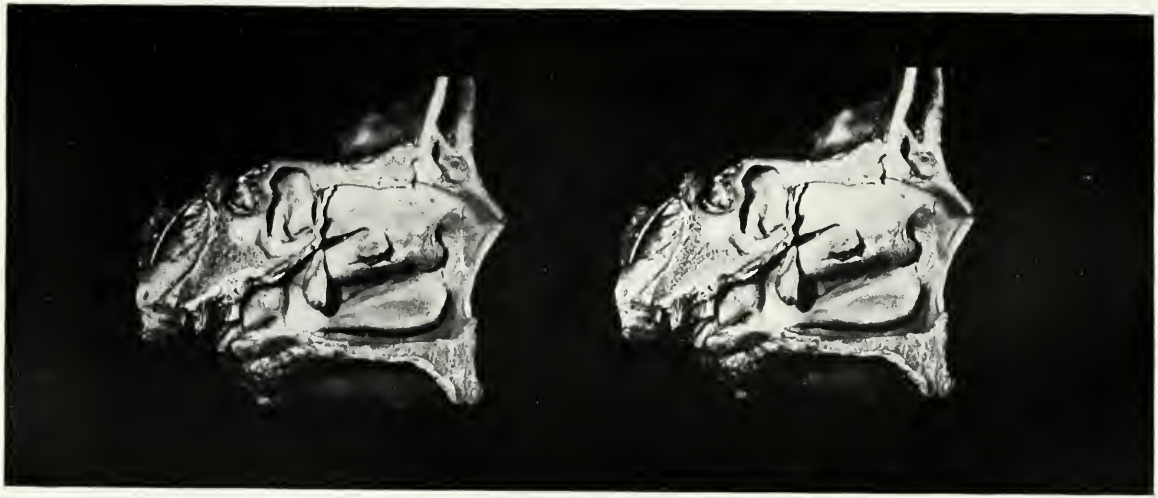
PLATE XLIV

LONGITUDINAL SECTION OF THE LEFT NASAL FOSSA



A mucous polypus has developed in the left sphenoidal sinus ostium, and grown down into the nasal passage.

ZUCKERKANDL.

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SAGITTAL SECTION THROUGH THE RIGHT NASAL PASSAGE

Case of chronic frontal sinus suppuration in which one sees an unusually large fronto-nasal duct in the course of which mucous polypi have arisen; it suggests very strongly the connection between suppuration and the occurrence of mucous polypus. But the main point of interest is that the preparation proves that frontal sinus suppuration is associated with, if it does not actually produce, unusual patency of the fronto-nasal duct.

ZUCKERKANDL.

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PLATE XLVI.

RIEDEL'S RADICAL FRONTAL SINUS OPERATION

On the left the whole anterior and inferior wall of the sinus, together with the nasal process of the superior maxillary bone, and the nasal bone of that side, have been removed, and the mucous membrane completely curetted away from the frontal sinus, together with free removal of the fronto-nasal ethmoidal cells. On the right side a small incision has been made, and the anterior wall of the frontal sinus trephined.

HAJEK

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KILLIAN'S RADICAL OPERATION ON THE FRONTAL SINUS COMPARED WITH THE MODIFICATION OF THAT OPERATION DESCRIBED BY HAJEK.

HAJEK KILLIAN

On the left side of the subject (right-hand side of the picture), Killian's operation is displayed; and on the other side is Hajek's modification, showing that there has been a much freer detachment of the orbital contents from the supra-orbital margin, giving freer access to the ethmoidal cells, which have been removed on both sides.

HAJEK.

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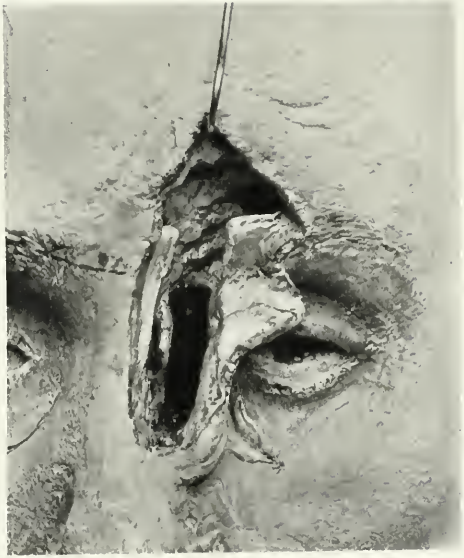
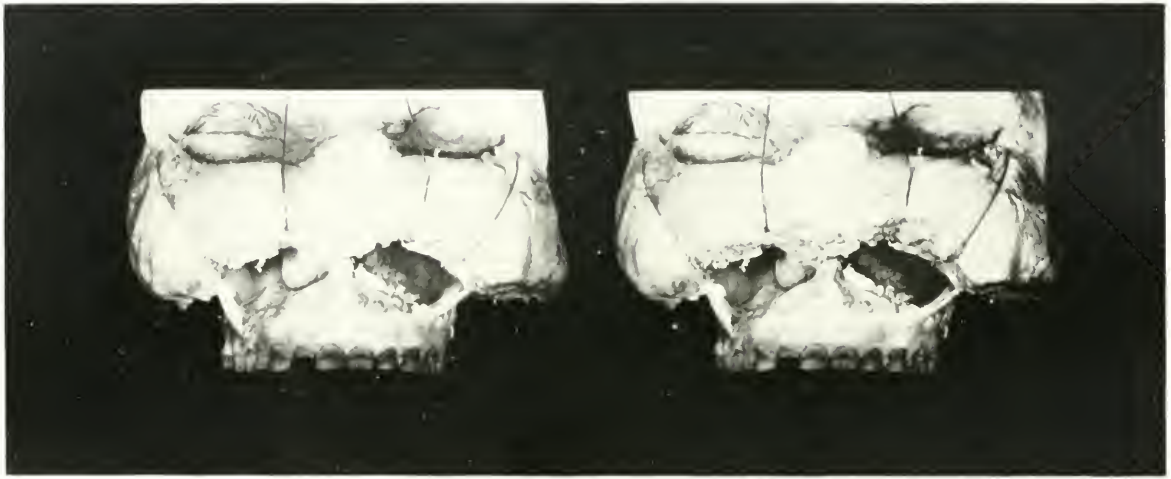
PLATE XLVIII.

WATSON WILLIAMS' OSTEOPLASTIC OPERATION ON THE FRONTAL SINUS



The author's osteoplastic radical operation for combined suppuration in the frontal sinus, ethmoidal cells, and sphenoidal sinus, etc.—"pansinusitis."

DENKER'S MODIFICATION OF THE CALDWELL-LUC RADICAL OPERATION ON THE MAXILLARY ANTRA.



An incision in the gingivo-labial angle, extending transversely from a point behind the first bicuspid tooth on one side to a similar point on the other side allows the periosteum to be stripped upwards and the upper lip and anterior end of the nose to be raised, as in the commencement of Rouge's operation, exposing the anterior walls of the antra. The antral cavities are laid freely open by removal of the whole anterior walls. The antromeatal wall corresponding with the inferior meatus having been removed, the antral cavities become practically part of the nasal passages. The lip is then replaced, and the transverse incision in the gum sutured.

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HAJEK.

TRANSVERSE SECTION THROUGH THE SKULL. *Viewed from behind.*

On either side the orbital fossæ are seen in section, the roof being formed by the anterior fossæ and the skull. It will be seen that the frontal sinus extends backwards from the inner half of the orbital roof on either side, so that although the section is made at least two inches from the front of the head, the posterior orbital extensions of the frontal sinuses are seen in section. When frontal sinus suppuration has occurred, necessitating obliteration of the sinus, it will be realized that it is impossible to remove pyogenic mucous membrane from such a narrow, deep, backward extension of such a frontal sinus; and that even if this can be done, it would not be possible to pack such a narrow slit, so as to make it granulate up from the bottom: while, on the other hand, the removal of that portion of the orbital roof would enable the orbital fat to rise up and obliterate the cavity—a procedure on which Killian lays so much stress in his operation. Passing from above backward, another feature to note is the position of the cribriform plate which is seen on either side of the crista galli. It occupies a very considerably lower plane than the higher ethmoidal cells on the right and left. On the right-hand side the middle turbinal body shows the presence of an ethmoid cell. Ethmoidal cells are found in the middle turbinate bone in about 20 per cent of cases. On the left-hand side, on the outer side of the middle turbinal the bulla ethmoidalis is seen making a rounded projection into the inferior meatus. The main point of interest, however, lies in the antral cavities. The left antral cavity is very much encroached upon by the dental cyst which has extended upwards and into the antra.

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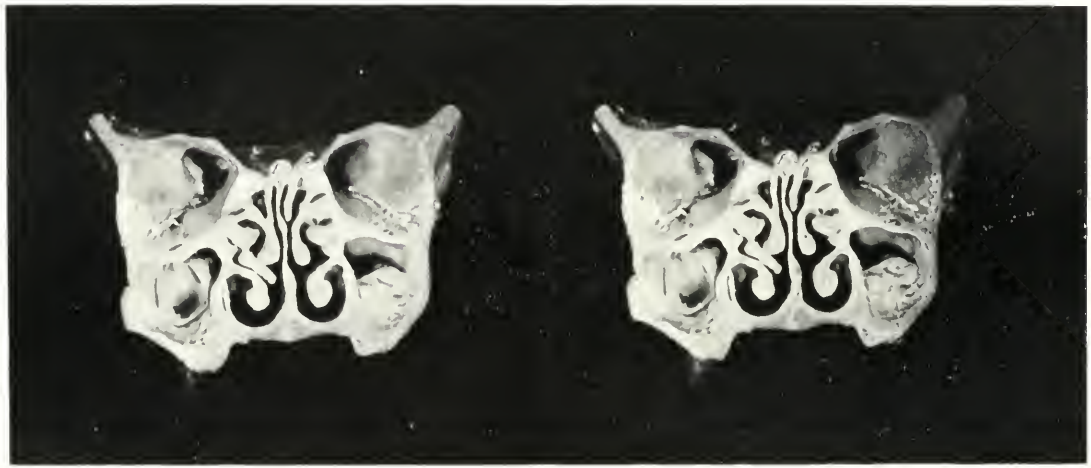
PLATE LI.

TRANSVERSE SECTION THROUGH THE NASAL CAVITIES AND ORBITS



Both maxillary antra show large cysts in the mucous membrane, that on the left side of the picture largely filling the antral cavity; this is interesting, as it shows that cystic degeneration of the antral mucosa does occur. In the middle meatus of this side is a small nasal mucous polyp, growing from the ethmoidal bulla, projecting into the nasal passage between the middle and superior turbinals. On this as well as on the opposite side, the uncinate process is seen in section beneath the bulla.

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PLATE LII

TRANSVERSE SECTION OF THE HEAD JUST POSTERIOR TO THE MIDDLE OF THE CRISTA GALLI.

Section looked at from behind, showing the relations of the orbits to the antral cavities, ethmoid cells, and nasal passages. Note especially that on each side the middle turbinal bodies are cystic, i.e., bony cysts (which are in reality aberrant ethmoid cells) have developed, and cause obstruction in the nasal passages. The cribriform plate (and therefore the roof of the nasal passages) is horizontally much lower than the roof of the orbits at this point.

ZUCKERKANDL.

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PLATE LIII.

HORIZONTAL SECTION OF SKULL THROUGH THE NASAL BONES, ETHMOIDAL CELLS, AND SPHENOIDAL SINUSES.

The relationship of the ethmoidal cells and sphenoidal sinuses to the inner orbital walls, etc., and to the outer and posterior aspects of the nasal passages, are clearly displayed.

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of the duct, probably being the cause of such unusual freedom of communication between the frontal sinus and the nasal cavity.

Some preparations are also illustrated (*Plates XLVI to XLVIII*), showing the operations of Prof. Killian, and Hajek's modification of Killian's radical operation for frontal sinus suppuration, as well as the author's operation on this sinus; these are sufficiently described in the lettering of the plates.

Plate XLIX is from a preparation by Doc. Dr. Hajek, showing Denker's modification of the Caldwell-Luc operation on the maxillary antra.

Plate L shows a dental cyst growing into the antral cavity; such cysts, when largely developed, cause distention of the antrum and thinning or absorption of the antral walls, especially the external wall, which results in external tumefaction of the cheek. The thinned walls yield a crackling sensation—the so-called egg-shell crackling—

Fig. 81.

Fig 82.

Two cases showing the cosmetic result after Watson Williams' osteoplastic radical frontal sinus operation. In both patients the left frontal sinus, and ethmoidal cells, anterior and posterior, have been extirpated. In *Fig.* 81 the sinus was of average size; but in the other case, *Fig.* 82, the sinus was exceptionally large, and a very slight depression above the brow occurred. In each case the operation illustrated in *Plate XLVIII* was performed and the suppuration cured. (From untouched negatives.)

on pressure. This is probably the usual, if not invariable, explanation of "hydrops antri," or mucocele of the antrum, as it is very doubtful whether accumulation of the secretion of the antrum proper ever leads to distention of the cavity with outward displacement of any part of the antral wall. But large cysts may develop in the lining mucosa, filling the antral cavities as shown in *Plate LI*.

Bony cysts may develop in the middle turbinal bones, as in *Plate LII*. These are really aberrant ethmoidal cells, but suppuration in these cavities may cause difficulty in diagnosing the source of pus, while the enormous size that these cavities may reach may cause very marked symptoms of nasal obstruction.

The section of the skull (*Plate LIII*) serves to recall the bony relationship of the ethmoidal cells to the orbit and the nasal passages.

NECK, WOUNDS OF THE LARGE ARTERIES OF.

Priestley Leech, M.D., F.R.C.S.

Bernabai[1] makes a contribution to the best method of treatment of wounds of the parotid and maxillary and mastoid regions of the neck accompanied by profuse primary or secondary hæmorrhage. In cases where the surgeon can find and ligate the wounded artery *in situ*, this should be done; where this is impossible or inadvisable, there is a difference of opinion as to whether one should ligature the common carotid trunk or tie both the internal and external carotid arteries just above their origin from the common carotid. Bernabai has collected several cases of the ligature of both carotids from surgical literature, and has added one of his own. The sudden suppression of the circulation in one half of the encephalon has been ascertained to occur as frequently when the common carotid has been tied as when its terminal branches, the external and internal, have been tied. The ligature of the common carotid exposes the patient to a greater liability to embolic phenomena than does the ligation of its two branches. He concludes: (1) In wounds of the maxillary-mastoid region ligation of the internal and external carotids is the best method of treating a primary or secondary hæmorrhage with the greatest safety, though not with absolute security. (2) Ligation of the common carotid suppresses suddenly the circulation in one-half of the encephalon, and also may give rise to the same immediate disturbances as the ligation of its two branches. (3) The formation of thrombi which may enter the primary collateral vessels from the periphery occurs in ligation of both the common carotid and its branches. (4) The ligation of the common carotid more frequently causes embolic phenomena than does ligation of its two branches.

REFERENCE.—[1] *Il Policl.* Ap. 19, 1908.

NEPHRITIS.

Prof. J. Rose Bradford, D.Sc., M.D.

Tyson,[1] in discussing the diagnosis and treatment of renal disease, draws attention to the necessity of separating that variety in which marked cardiovascular changes are present, and to this he would apply the term cardiovascular renal disease, including under this those cases in which there is distinct hypertrophy of the heart, with thickening and hardening of the arteries. Tyson considers that cardiovascular renal disease exists in two forms, a diffuse and a localized variety. The thickening and hardening of the vessels usually increase with the duration of the renal disease, although not necessarily to a corresponding extent. The arterial lesion is usually supposed to be of toxic origin and similar to that produced by syphilis, alcohol, or lead, but in addition to these causes various writers have suggested other possible factors, as for example nervous influences, as it would seem that nerve strain may be a factor in the production of high tension and of sclerosis. Further, some of these cases affect several members of one family, and thus possibly a hereditary influence may be present. Osborne made the suggestion that variations in the activity of certain glands like the thyroid and the suprarenal, the internal secretions of

which have distinct actions on the blood-pressure, may be factors of importance in the production of high tension, cardiac hypertrophy, and arterial sclerosis. Tyson is distinctly of opinion that arterial sclerosis may be secondary to primary renal disease, although in many cases the renal is secondary to the arterial lesion. It is, however, difficult to diagnose with certainty between the primary and the secondary cases, inasmuch as both are insidious, but Tyson considers that albuminuria and casts appear earlier in the course of the primary renal cases, and in many of those of general arteriosclerosis there is no albuminuria, although brain symptoms dependent on cerebral anæmia, such as vertigo, tinnitus, and amaurosis, may be well marked.

Tyson also draws attention to the important point that in many of these cases of general arteriosclerosis, symptoms resembling those of uræmia may be present. One of the most important means of distinguishing between the primary and the secondary renal lesions associated with arteriosclerosis is the state of the fundus oculi. In the primary renal cases albuminuric retinitis is prone to occur, whereas in general arteriosclerosis there is marked thickening of the retinal arteries. Another point of difference, according to Tyson, is found in the study of the blood-pressure. In general arteriosclerosis the tension may be increased, but not to so great an extent as in the renal cases.

Tyson also draws attention to the difficulty in diagnosing between some cases of chronic parenchymatous nephritis and cases of renal sclerosis where cardiac failure has supervened and, as a result, dropsy is present, or even cases of primary cardiac disease. He considers that if a mitral murmur is present, and the urine is scanty and of high specific gravity, the probabilities are in favour of primary cardiac disease, even if casts are present. In the renal cases there is usually sharp accentuation of the aortic second sound. Further, in the renal cases the blood-pressure is usually high, and some information may be obtained by comparing both the systolic and the diastolic pressure; in the renal cases these are both high, but in primary cardiac disease, with mere congestion of the kidney, the diastolic pressure is low, although the systolic may be high.

In the treatment of these cases of high tension, Tyson considers that the **Iodide of Sodium** is especially useful, and that where the cardiac action is very powerful, tincture of **Aconite**, in doses of from 3 to 5 drops, is useful; he considers that this remedy is often more satisfactory than either nitroglycerin or nitrite of soda. In the cases where marked cardiac lesions are present, the liquids in the food should be restricted and free purgation employed. Amongst diuretics, theobromine, caffeine, diuretin, theocin, and agurin are useful. **Caffeine** is often of great use, and may be even combined with digitalis. **Theobromine** has the advantage of being more prolonged in its action than caffeine. Tyson is of opinion that **Theocin** is also very useful, and it may be given in doses of from 4 to 8 gr. Diuretics such as these are of little avail in cases where the renal lesion is advanced.

References.—[1]*Amer. Jour. Med. Sci.* Jan. 1908; [2]*N. Y. Med. Jour* Aug. 1904.

NEURALGIA AND NEURITIS. (*See also* TIC DOULOUREUX.)

Purves Stewart, M.D.

Sciatica, tic douloureux, and other acute forms of neuralgia can often be successfully treated by applying the principle of **Kataphoresis** or **Electric Osmosis**, in which a galvanic current is employed to split electrolytic drugs into their opposing '**Ions**' or electrified particles of matter, of which one, the kat-ion or the an-ion, as the case may be, is forced through the unbroken skin and absorbed into the tissues immediately subjacent to the electrode.

The substances employed in this way must be electrolytes, i.e., substances which when in solution can be dissociated by a galvanic current into their elements or ions. The only electrolytes are acids, bases, and salts. Substances such as albumin, urea, sugar, and colloid bodies are not dissociated by a galvanic current, and are therefore not electrolytes. When an electrolyte, in solution, has a galvanic current passed through it, it splits up into its opposing ions, of which the electro-positive ions, constituting the metal atom or base of the salt, being positively charged, are repelled from the positive pole and attracted towards the negative pole or kathode; they are therefore called *kat-ions*. Conversely, the electro-negative ions, forming the negatively-charged acid radicle, are repelled from the negative pole and attracted to the anode; they are therefore called *an-ions*. It should be remembered that the same element may be electro-positive in one combination and electro-negative in another. For example, in a solution containing HCl, hydrogen is a kat-ion, whilst in a solution of KOH the kat-ion is potassium and the an-ion is the hydroxyl OH.

The tissues of the body form an electrolyte, and galvanic currents are conveyed through them by the migration of ions. And if a solution of an electrolyte drug be placed on the skin at the point where a galvanic current is passing, part of its ions will be carried through and deposited in the tissues. For example, iodine and salicylic acid are two drugs whose ions are electro-negative. They are therefore applied through the skin by means of the negative pole or kathode. Iodide ions are therefore applied either by painting the skin with a solution of iodine, or by wetting the padded kathode in a solution of iodide of potassium; salicylic acid ions are applied most conveniently by dusting powdered salicylate of soda on the wetted pad of the kathode. The current should be slowly turned on, cell by cell, until from 15 to 20 milliampères are passing. After ten minutes or so of this, the current may be increased still further, to 25 or 30 ma., turning it off at last, not with a sudden "opening" shock, but by gradually switching the current collector down to zero before finally removing the electrode.

Metals and alkaloids, on the other hand (such as lithium in lithium carbonate, or quinine, cocaine, morphine, or aconitine), act as kat-ions, and are therefore made to penetrate the tissues by the anode or positive pole.

In the treatment of tic douloureux, encouraging results have been

obtained by Dawson Turner[1] and others by the kataphoresis of a salicylic ion (applied on the negative pole) or of a quinine ion (applied on the positive pole) over the painful area, being careful to avoid abrupt changes in the strength of the galvanic current. Each séance should last many minutes, and should be under the immediate supervision of a qualified electrotherapeutist.

Stevenson[2] has repeated the observations of Krauss in a series of thirty-two cases of neuritis of various nerves, treated by the administration of **Nitroglycerin** in the following manner: Beginning with $\frac{1}{100}$ gr. every eight hours, the interval was reduced by one hour each day until the full physiological effect of the drug was obtained, or until the patient was taking $\frac{1}{100}$ gr. every three hours. Small doses of sodium bromide were given to control the disagreeable flushing and headache. The three-hourly administration of the drug was maintained for some time. Within forty-eight hours the effects were usually evident in the relief of pain, in acute cases. In subacute cases (defined by Stevenson as those of from ten days to three weeks' duration) improvement was slower, but cure was complete within two weeks. Chronic cases, of more than three weeks' duration, were admittedly more obstinate, but Stevenson claims to have improved all of seven such chronic examples. In them iodide of potassium and ammonium bromide were given in progressively increasing doses, to hasten the action of the nitroglycerin; the actual cautery was also applied over the course of the affected nerve. A consideration of these cases seems to indicate that in recent cases of neuritis, whether post-influenzal, rheumatic, gonorrhœal, or diabetic (not in traumatic cases) nitroglycerin sometimes produces encouraging results. In two cases of diabetic neuritis the polyuria was diminished and the sugar-excretion was also lessened.

References.—[1]*Brit. Med. Jour.* Ap. 4, 1908; [2]*Med. Rec.* May 16, 1908.

NEURALGIA, INTERCOSTAL.

(*Vol.* 1906, p. 5)—**Injections of Air** beneath the skin in the vicinity of the affected nerve give relief from the pain at once or after a brief delay. A quarter to half a litre should be slowly injected; this takes eight or ten days to be absorbed.

NEURASTHENIA.

(*Vol.* 1908, p. 390)—The general principles of treatment are thus laid down by Purves Stewart: "Complete change of environment, physical and mental rest, simple and nutritious diet, careful attention to intestinal elimination, massage, baths, and electricity." The four essentials of the Weir-Mitchell treatment are absolute and prolonged rest in bed, isolation from the outside world with a specially chosen nurse as sole companion, systematic massage, and full diet.

NOMA. (*See* Gangrene, Cutaneous.)

NOSE, DISEASES OF. *William Milligan, M.D.*
D. Lindley Sewell, M.B.

Anosmia.—In a paper on the "Functional Element in certain Forms of Anosmia," P. McBride[1] classifies the many causes of loss of smell as follows: (1) Obstructions in the nostrils which prevent odorous particles from reaching the olfactory region; (2) Changes

in the olfactory region, which may be inflammatory, the result of disease (syphilis, tubercle, or atrophy); (3) Injury, congenital defects, or disease, affecting the olfactory centres, bulbs, or nerves; (4) Causes which we cannot localize, but which probably have a definite pathological basis, of which the most important is influenza; (5) Functional, anosmia occurring during pregnancy and menstruation, hysteria, and under conditions we cannot further define, but which the following case illustrates:—

"An unmarried lady, aged 27, was first seen in February, 1887. She could smell quite well up to September of the previous year, and at some time between September and November lost her sense of smell. She could, however, taste food. On examination, enlargement of the middle turbinate was the only abnormality found. Treatment consisted of cauterization of the middle turbinate with silver nitrate solution, chromic acid, and eventually the electro-cautery. An alkaline spray was also prescribed. Up to July, 1887, she had only on one occasion detected cigar smoke and on another whisky. On July 7th, however, she was able to smell after the application of the electro-cautery. This, however, was lost again. Suspecting a functional element, zinc valerianate was prescribed. The patient was most intelligent, and apparently the reverse of neurotic. She was asked to keep Dr. McBride informed of her subsequent history, and in 1891 a letter was received containing the information that she was now married and had recovered her sense of smell after a recent severe cold.

The salient features of this case were: (1) Complete loss of smell and preserved taste. It will be remembered that sweet, salt, acid, and bitter are the only so-called tastes which are perceived by the gustatory nerves, and that flavours are really impressions of smell. The power, then, of being able to appreciate food proved that there was no gross lesion of the nervous apparatus concerned in the act of smelling. (2) The temporary recovery of smell after the application of the cautery. (3) The permanent recovery after a cold and marriage. It appears evident that for want of data for further definition the anosmia must be classed as due to functional causes. Other similar cases are cited in which the loss of smell must be regarded as functional. Unfortunately we possess no methods of investigating the sense of smell at all comparable with those employed in studying nerve deafness. The nearest approach to this is the olfactometer of Zwaardemaker, which consists of an odoriferous cylinder sliding over a glass tube, the open extremity of which is inserted into the patient's nostril. Reuter, writing on neuritis of the olfactory nerve, assumes that in respiratory anosmia all classes of odours are equally affected, while in affections of the nerve the opposite is the case. The writer concludes as follows: "In the cases I have brought forward, facts have been adduced which seem to me to prove that loss of smell in the presence of nasal obstruction is by no means always due to this cause. If the obstruction be very marked, operative measures will be indicated on general principles. The difficulty in arriving at a decision is pronounced in those cases in which the middle turbinals are somewhat enlarged, and may give rise to the symptom. It might be thought, as indeed I did think until recently, that where the sense

of smell returned after measures calculated to diminish the enlargement, we have sufficient evidence to justify an expectation of great benefit to be derived from operative procedure. The cases I have detailed, however, show that this is not so. At one time it seemed to me that, given a case of anosmia with retention of the power of appreciating the flavours of food, and an obstructive condition detected by anterior rhinoscopy which might interfere with the entrance of odorous particles, we were justified in concluding that the removal of the obstruction would benefit, or even restore, the sense of smell. It appeared probable that the preservation of the power of tasting in the above sense indicated a healthy condition of the olfactory nerve. An analysis of my cases, however, negatives this view."

Congenital Occlusion of Posterior Nares.[2]—Congenital occlusion of the posterior nares is a rare but important anomaly. The occlusions are not in the true sense pathological, but developmental, the bone composing them showing the true elements of bone and being covered by a true mucosa continuous with that of the nose in front and of the pharynx behind. They may be bony or membranous, or partly both. In adults unilateral occlusion is far more common than bilateral, since a large number of bilateral cases must die in infancy. It is probable that the explanation of the origin of the condition lies in an undue embryological activity at the points of contact between the mid-frontal process (or septum) and the maxillary processes (or external nasal walls) which leads to closure of the posterior nasal opening. In double occlusion the symptoms are marked from the beginning of life. The child, born in great asphyxia, suffers from frequent attacks of suffocation and vomiting, and is fed with extreme difficulty, nursing being impossible. In later life the symptoms are such as arise from nasal obstruction.

The diagnosis in adults is easy if a careful examination with mirror and probe is made; in infants the diagnosis is more difficult, and often can be only demonstrated by a bent probe passed into the nasopharynx and another through the nose. MacKenty operates with a trocar or dental drill, making as large an opening from the nose into the nasopharynx as possible.

It is important in operating to keep well to the inner side against the septum, all the structures which are to be avoided lying against the outer nasal wall. The finger should be kept in the nasopharynx as a guide while the drill is being used. If necessary, some of the posterior end of the vomer may be taken away in order to make more room, but in no case should gauze packing or elastic wedges be used after operation.

Turbinectomy.—Submucous turbinectomy is suggested by Stuart Low[3] as a means of relieving a common form of nasal obstruction without sacrificing the nasal mucous membrane and erectile tissue. Under cocaine and adrenalin anæsthesia, with the aid of reflected light, an incision is made through the mucous membrane of the inferior turbinate down to the bone. "The incision should extend

longitudinally for nearly half the length of the turbinal surface, and be along the most dependant part; it should be continued anteriorly up to the point of attachment of the turbinal. A sharp-pointed, somewhat curved reflector should now be introduced at the incision, and the soft tissues raised from the bone." When the soft tissue has been raised a little way it is better to use a blunt curved director. After the mucous membrane is raised, it remains to cut away the cribriform plate of bone. "This is accomplished by first severing its connection with the outer denser portion by means of short-bladed, sharp scissors pushed forcibly backwards, and then the extraction of the severed bone is completed with a pair of long thin forceps. The flaps should be pressed outwards on the outer wall of the nose, and maintained in position by means of plugs of cotton wool forcibly wedged into the nasal passages, the object being to bring the cut edges into apposition, so that healing takes place rapidly."

A similar method is applicable to operation on the middle turbinal.

Atrophic Rhinitis.—Bilateral atrophic rhinitis in adults is the outcome of a purulent rhinitis of childhood, but Parker[4] points out that unilateral cases arise from different etiological factors, which are: (1) A deviation of the nasal septum, which causes excessive roominess of one nasal fossa and obstruction of the other. These abnormalities reach their greatest proportions after puberty; (2) The establishment of a chronic mucopurulent discharge as the result of acute rhinitis or influenza; (3) Drying of the muco-pus into crusts, the expulsion of which by blowing is rendered ineffective through the roominess of the fossa; (4) Putrefaction of the retained crusts occurs, leading to ozæna.

The inferior turbinals are still fairly well developed and functionally active, and the rational treatment consists in reducing the roomy side to proportions which allow of expulsion of crusts by blowing, and restoring the patency of the other side. This is best effected by Killian's submucous resection of the septum. After the operation it is necessary to use the alkaline nasal wash for some time, but the ozæna and crusts almost immediately disappear owing to the thorough cleansing of the nasal passages by blowing, which is now rendered possible.

Membranous Rhinitis.[5]—Membranous rhinitis, a by no means rare disease, usually occurs in children, 90 per cent of cases met with being under ten. There is very little general disturbance—seldom enough to cause detention from school. An irritating nasal discharge, at first watery, later purulent, which excoriates the alæ nasi and upper lip, is the first thing to attract attention. Bleeding and marked nasal obstruction are present. On examination, the mucous membrane, if visible, is congested and covered by a thin white film, which cannot easily be wiped away. Sometimes the nasal fossæ are filled with a gelatinous white membrane; at a later stage we find no membrane, but only blood and mucopurulent material. The disease generally runs its course in from four to six weeks, but may last three months. Paralysis never occurs, and the only complication likely to arise is

otitis media. A culture taken from the membranous discharge yields diphtheria bacilli in large numbers.

The long duration of symptoms, the bleeding, the discovery of the fibrinous exudate, and finally of the diphtheria bacilli, distinguish the bilateral cases from ordinary nasal catarrh. In about 20 per cent of cases the disease is unilateral, and by a careful examination is easily distinguished from a foreign body in the nose.

When the diagnosis has been confirmed by bacteriological examination, it is important to isolate the patient at once. **Antidiphtheritic Toxine** should be injected, and the nasal passages irrigated with a weak antiseptic lotion, such as **Boric Acid** (5 gr. to the ounce).

The disease derives its interest, not from its danger to the patient, but from the presence of the diphtheria bacillus in a virulent condition. Although the fact was at first unrecognized, and later had much doubt thrown upon it, it is now practically certain that the bacilli of membranous rhinitis and diphtheria are identical. Any one becoming infected from such a case, however, is most likely to suffer from rhinitis or a sore throat, with a small patch of exudation, and most unlikely to suffer from severe diphtheria.

References.—[1]*Brit. Med. Jour.* Oct. 12, 1907 ; [2]*Med. Rec.* Sept. 7, 1908 ; [3]*Brit. Med. Jour.* Oct. 17, 1907 ; [4]*Clin. Journ.* Oct. 16, 1907 ; [5]*Pract.* Jan. 1908.

NOSE, FOREIGN BODIES IN.

(*Index of Treatment*)—Lambert Lack advises the use of a small blunt hook (for instance, a probe bent to a right angle a quarter of an inch from its end). It should be introduced through the middle meatus over and beyond the foreign body, which lies usually in the front part of the inferior meatus ; it is lowered gently till its point touches the floor of the nose, and then drawn forwards. Sometimes, in nervous children, chloroform is necessary.

ŒDEMA, ACUTE PULMONARY.

Joseph J. Perkins, M.A., M.B., F.R.C.P.

Symptoms.—Acute œdema of the lungs is characterized by the almost sudden onset of intense dyspnœa, preceded perhaps for a short time by a feeling of uneasiness and constriction of the chest. The face is pallid, the lips are cyanosed ; slight cough starts, and soon frothy pink or blood-stained fluid gushes from the mouth and nose, or is coughed up in large quantities. At the same time, on listening over the lungs innumerable fine and medium râles are heard all over. The pulse tension is high more often than not, and albumin may appear in the urine. The attacks in most of the reported cases have occurred at night, are always attended with great danger, and may prove rapidly or immediately fatal.

The Diagnosis depends on the copious, frothy expectoration, coupled with the presence of generalized râles throughout the chest. These differentiate the dyspnœa of acute œdema from the other forms of acute dyspnœa—cardiac, asthmatic, or uræmic.

Post mortem, the lungs are found distended to their utmost capacity, showing the markings of the ribs. On section, fluid similar to the expectoration pours from them, and microscopically the alveoli are found to be flooded with liquid, but the capillaries of the alveolar walls

are not distended with blood, as in chronic venous congestion, but compressed by the exudation.

Causation.—The chief conditions with which such attacks are associated are: (1) Heart disease, valvular or myocardial, especially aortic disease; (2) Bright's disease; (3) Arteriosclerosis. They occur also but less frequently, in connection with the infectious fevers, asthma, and pregnancy. A condition similar both as regards symptoms and post-mortem appearances occurs after paracentesis thoracis, especially if a large amount of fluid is withdrawn.

Etiology.—The œdema is due to arterial congestion, and differs from the ordinary chronic venous congestion and œdema due to back pressure in the lungs by its suddenness and gravity. The alveoli are suddenly flooded with fluid which escapes from the capillaries of the lung. Various theories have been brought forward to explain the extreme arterial congestion which must be present and precede the appearance of the œdema. The mechanical view supposes that owing to failure of some kind on the part of the left ventricle, all the pulmonary system becomes over-full, the right ventricle continuing to contract. Unfortunately for the theory, it has been found experimentally that ligature of the aorta and all the pulmonary veins, though it raises enormously the pulmonary blood-pressure, does not cause acute œdema. The sudden distention of the pulmonary arteries looks as though the nervous system were involved, and it has been suggested that an upset of the vasomotor innervation may be the cause. Experimentally, it has been found that salicylate of methyl in poisonous dose will produce an intense œdema if at the same time the aorta is compressed and the cardiac plexus stimulated.

Possibly, then, some toxic agent may be at work acting on the vasomotor system to produce the attacks, and their comparative frequency in renal disease, especially interstitial nephritis, is in favour of this view. Even so, the common association of cardiac disease would suggest that there is also some element of cardiac failure involved in many instances. It must not be forgotten, however, that acute pulmonary œdema occurs without either renal or cardiac lesions, e.g., in the course of the infectious fevers.

Treatment.—All cardiac stimulants will of course be employed, but they have often proved quite ineffectual. The condition admits of no delay, and recourse should be had at once to **Venesection** or **Cupping**, both of which have received high commendation. The writer has seen almost immediate relief follow the use of the latter measure.

References.—H. Méry and L. Babonneix, *Gaz. des Hôp.* Sept. 26, 1907; S. W. Newmayer, *N. Y. Med. Jour.* Nov. 16, 1907; Leonard Williams *Lancet*, Dec. 7, 1907.

ŒSOPHAGITIS, ACUTE.

(*Vol.* 1906, p. 5)—In cases of corrosive poisoning, the use of Adrenalin produces so immediate a relief that fluids can be swallowed a few minutes after its administration. Five to ten drops of the 1–1000 solution should be taken three or four times daily.

ŒSOPHAGUS, DILATATION OF. (*See* STOMACH, DISEASES OF.)

ŒSOPHAGUS, DISEASES OF. *William Milligan, M.D.*
D. Lindley Sewell, M.B.

The value of direct examination of the œsophagus for the presence of foreign bodies and for the detection of morbid conditions is gradually being recognized. As a preliminary to examination, R. Fullerton[1] advises that no food be taken for at least five hours previous to the passage of the **Œsophagoscope**. In adults he has found local anæsthesia sufficient, provided that care be taken to thoroughly cocainize the posterior cricoid region.

Joseph Merzbach,[2] on the other hand, advocates the performance of œsophagoscopy under general anæsthesia. For the removal of foreign bodies, he considers the employment of the œsophagoscope far superior to probangs, and even to removal (after the use of X rays) by external incision. The œsophagoscope may be passed with the patient in one of three different positions: (1) Sitting upon a low stool, neck extended and head thrown back; (2) Recumbent and the head hanging over the end of the table; (3) Von Mikulicz's lateral position.

Guisez[3] calls attention to the value of œsophagoscopy as a means of accurately diagnosing the existence of *cardio-spasm* and of efficiently treating this serious affection. He quotes the records of four cases, in all of which marked dilatation of the œsophagus existed, accompanied by evidences of severe cachexia. The treatment adopted, after an accurate diagnosis had been rendered possible by direct inspection, consisted in careful mechanical dilatation of the cardiac sphincters and subsequent irrigation with an alkaline solution performed with Faucher's tube, in order to combat the inflammatory condition of the mucosa.

REFERENCES.—[1]*Glas. Med. Jour.* June, 1908; [2]*Amer. Jour. Med. Sci.* Ap. 1908 · [3]*Jour. of Laryng.* Sept. 1908.

ONYCHIA.

(*Vol.* 1907, p. 74; 1908, p. 96)—**X Rays** were applied to three cases, with gratifying results. Six to nine sittings effected a cure; the nail was not lost, but was eventually restored to a normal appearance.

OPHTHALMIA. (*See* CONJUNCTIVA).

OPHTHALMIA NEONATORUM. (*See* CONJUNCTIVA.)

OPTIC NERVE, DISEASES OF. *Ernest E. Maddox, M.D., F.R.C.S.*

Amblyopia in Children.—Succeeding a communication by Nettleship, in 1883, "On cases of Recovery from Amaurosis in Young Children," in which notes of nineteen cases were given, Sydney Stephenson[1] now contributes a valuable paper on amblyopia in children accompanied by signs of incomplete post-papillitic atrophy of the optic disc, distinguishable by the ophthalmoscope. In his experience the signs are invariably bilateral, and "inquiry into the patient's personal history often elicits the fact that during infancy there had been a

'cerebral' or 'meningitic' illness, marked by such symptoms as 'fits,' convulsions, headache, vomiting, constipation, retraction of the head, temporary paralysis, squint, unconsciousness, and so forth. On recovery from the attack, sight was found to be partially or totally lost, but has since been more or less regained. The conclusion is almost inevitable that an infantile meningitis or encephalitis was accompanied by optic papillitis, and that both the general and local condition had to some extent been recovered from. The incomplete optic atrophy seen later by the ophthalmic surgeon, then, is on this view to be regarded as a sequel to a meningitic papillitis."

In another class of case, designated by Wm. Gay "*acute cerebral amaurosis of infancy*," and by Sydney Stephenson "*fleeting amaurosis*," infants suffering from basal meningitis appear to suffer total loss of sight for a time, slowly recovering both vision and health. These cases differ from the post-papillitic atrophy ones, in that there are no ophthalmoscopic signs.

Yet a third class has been called by Ashley and Stephenson "*post-eclampsic amaurosis*," since it not only follows convulsions, but in their view is caused by them, or rather by an extension of the nerve-storm so as to involve the visual cortical centres as well as the Rolandic motor centres, the period of discharge being followed by a period of exhaustion. When the child regains consciousness, he is found to be blind without ophthalmoscopic signs, and as accompaniments may be noted aphasia and hemiplegia of a temporary or of a more lasting type.

Tobacco Amblyopia.—The most important element in treatment is of course the discontinuance of smoking. **Nux Vomica** is generally given in the early stages, and Granger recommends **Iron** later on. Wray's well-known treatment consists of large potations of **Water**, with abundant **Exercise**, in the hope of washing out the nicotine, and this is undoubtedly a good suggestion. **Massage** of the eyeball was also recommended two or three years ago by Ettles, and acts by bringing fresh lymph to the minute cells of the ganglionic layer of the retina. For the diagnosis of this condition, *see* EYE (DIAGNOSTIC METHODS).

Optic Neuritis.—Leslie Paton[2] has analyzed 252 cases of optic neuritis in cerebral tumours, 148 of which were confirmed by operation or by autopsy. His principal conclusions are: (1) Optic neuritis is most frequent in tumours of the cerebellum and of the cerebral cortex. It is least frequent in tumours of the subcortical white matter and pons. (2) The intensity in tumours of the cerebral cortex varies inversely with the distance of the part affected from the anterior pole of the middle fossa. (3) The intensity of the neuritis is not reliable as a guide to the side affected by the tumour, nor is the commencement of the neuritis of much greater value as indicating the side of the tumour. (4) Macular fans may occur in neuritis in tumours in any position, and are simply indications of an intense œdema. He regards the optic neuritis as a local manifestation of a generalized œdema of the cerebral tissues produced by the irritation of the presence of an

actively growing foreign body—the tumour. Temporary loss of vision in intracranial tumour without optic neuritis is, in his view, due to pressure on the chiasma from a distended third ventricle.

Mr. Paton's analysis derives its value especially from the fact that the majority of the cases were those recorded by Mr. Marcus Gunn, and all very carefully entered in the National Hospital, Queen Square. Some divergence of opinion was expressed as to the degree of frequency with which the earliest or more intense optic neuritis is homolateral with the tumour. Sir Victor Horsley believed *homolaterality* of the lesion to be of the greatest clinical value, especially with reference to the age of the neuritis. Beevor is of the same opinion, but Buzzard maintains that too much reliance has been placed in the past on the homolateral view. Mr. Gunn expressed his belief that in tumours occupying the anterior half of the brain the new growth was generally on the same side as the earlier or more intense optic neuritis. But in the posterior half of the cerebrum and in the cerebellum the ophthalmoscopic findings were of little or no value in this respect. The interesting observation was made by Buzzard that those situations in the brain where tumours are least associated with optic neuritis, viz., the subcortical white matter and pons, being more poorly vascularized, and more favourite sites for vascular thrombosis, are just those in which tumours do not grow so fast, and would lead to more necrosis in their march, thus increasing more slowly the tension in the cranium.

Augiéras[3] records three cases of optic neuritis apparently caused by infection from purulent otitis, suppuration following an ingrowing toe-nail, and ulceration of the cervix uteri, respectively. Active mercurial treatment was employed, and he believes with good results.

Guichemerre and Rochon-Duvigneaud[4] record a case of optic neuritis in a doctor occurring a fortnight after an insect's sting on the wrist, which produced a local abscess. The optic neuritis was accompanied with severe occipital and peri-orbital pain and diminution of vision of the left eye to $\frac{5}{60}$. After two months the vision was restored to $\frac{6}{9}$. A slight dyschromatopsia persisted. The only treatment employed was milk diet, diuretics, purgatives, and the application of leeches

A somewhat similar case occurred in the reviewer's practice this year. Severe neuralgia of the left eye and head, with optic neuritis in the left eye, was followed by total blindness for some weeks, with partial recovery of sight thereafter. The focus of infection was discovered to be in a tooth temporarily stopped, and from which a virulent streptococcic culture was obtained. It was mostly retrobulbar neuritis.

Babinski and Chaillons[5] report eight cases of optic neuritis of intracranial origin treated by **Lumbar Puncture**, with success in nearly all. They recommend it in cases of post-traumatic or inflammatory intracranial effusion. When an intracranial tumour is the cause, the puncture is only palliative, and may be considered as an alternative to trephining of the skull. They lay stress on the horizontal position

of the patient during the operation and for several days afterwards, and on evacuation of the cerebrospinal fluid very slowly, drop by drop, and in small quantity (8 to 10 cc. at most). Conversely—

Koenig,[6] recognizing that peripheral optic neuritis with infiltration limited to the nerve-ending, and not due to cerebral lesion, but to infectious diseases, toxins, or diathetic affections, cannot be surgically treated by trephining or lumbar punctures, recommends emptying of the anterior chamber by **Sclerotomy.** The relief to the blood-vessels in the ciliary body by escape of the aqueous is said to have a beneficial effect upon the nerve head. This conclusion awaits confirmation by others.

References.—[1]*Brit. Med. Jour.* July, 1908; [2]*Trans. Ophth. Soc.* 1908, p. 112; [3]*Ophthalmoscope*, June, 1908, p. 447; [4]*Ibid.*; [5]*Ann. d'Oculistique*, July, 1907; [6]*Ophthalmoscope*, June, 1905, p. 449.

OSTEOMALACIA. *Robt. Hutchison, M.D.*

Bossi[1] has recommended injections of **Adrenalin** in the treatment of osteomalacia, and has reported some apparent cures obtained by its means. Of others who have tried this method, some have reported favourably upon it; others the reverse.[2] The dose recommended is ½ cc. of adrenalin solution (1–1000), which is given subcutaneously, at first once a day, and afterwards, if no bad symptoms appear, twice daily. Puppel[3] thinks that in all severe cases which are not complicated by pregnancy and which have existed for some time it is best, preferably soon after a pregnancy, to perform **Castration.** Slight and early cases, without pregnancy, should be treated with **Phosphorus.** In those cases, however, which are first detected during pregnancy, and in which the pelvis is still comparatively normal, one should always try to allow the pregnancy to go on and to retain the ovaries. In such cases the adrenalin treatment is worth trying.

References.—[1]*Centralb. f. Gynak.* 1907, pp. 69 and 172; [2]Review in *Sem. Méd.* May 20, 1908; [3]*Centralb. f. Gynak.* Dec. 7, 1907.

OTALGIA.

(*Vol.* 1896, p. 277)—Treat the cause (dental caries, pharyngitis, etc.). Instillations of **Cocaine**, 10 per cent solution, into the external auditory canal are recommended with or without a feeble continuous current passed through it.

OTITIS. (*See* Ear.)

OVARY, DISEASES OF. *Victor Bonney, M.S., M.D., B.Sc., F.R.C.S.*

Carmichael and Marshall[1] have carried out some interesting experiments bearing on the value of the ovaries, in full-grown and immature rabbits. As a result they find: (1) The removal of the ovaries in young animals prevents the development of the uterus and Fallopian tubes, and in adult animals leads to a degenerative fibrosis of these structures; (2) The removal of the uterus in either full-grown or immature animals does not affect the development or functional powers of the ovaries. These experiments are valuable, and show the propriety of conserving the ovaries in all cases of hysterectomy where-

ever the safety of the patient, either immediate or remote, is not thereby endangered.

Sampson[2] has published some observations on the relation of the ovary to pain, founded on ten cases of ovariotomy under infiltration anæsthesia. He found that the ovarian cyst *per se* is very slightly sensitive, but that traction on its pedicle causes pain. The insensitiveness of the ovary is in marked contrast to the extremely delicate perception of pain appertaining to the parietal peritoneum. He concludes that when pain is present in association with ovarian cystomata, either secondary changes in the cysts or adjacent structures are in progress, or there is some tension being exercised on the pedicle of the tumour.

Ravant[3] has analyzed 699 cases of ovarian tumour, with the following results: (1) About half of those occurring between the ages of forty and sixty are malignant; (2) Ovarian tumours in childhood up to fifteen years are almost always sarcomatous; (3) When one ovary is the seat of malignant disease it is advisable to remove the other ovary also. These results are interesting, because it is gradually becoming apparent that a much larger proportion of ovarian cysts are primarily malignant or contain areas of secondary malignancy than was formerly suspected. Cases not infrequently occur in which, after the removal of an apparently innocent cyst recurrent growth makes its appearance. The cysts most to be suspected are those in which areas of solid tissue are present in the tumour. When this is the case no definite statement as to the prognosis should be given until a thorough microscopical examination has been made. Such areas when thus investigated not infrequently exhibit appearances which are histologically malignant. The importance of removing entirely, without tapping, all cysts not very obviously innocent, is apparent, for where this is done a fair prospect of permanent cure can be obtained in spite of the fact that certain areas of the tumour have become malignant.

Victor Bonney[4] has drawn attention to the frequency with which a history of amenorrhœa is present in cases of acute tubo-ovarian abscess, and their consequent simulation of the symptoms of ruptured tubal gestation. In the case of either disorder the onset is acute, and in a short time a tumour is formed. In either case, too, this tumour is a conglomerate, consisting, besides the ovary and tube, of matted omentum and bowel, thickened mesometrium, and inflammatory peritoneal exudate. Thus, substituting the word blood for pus, or pus for blood, as the case may be, the same description applies to either of them. The reason for the frequency with which a period is missed at the onset of a tubo-ovarian abscess is probably to be explained by the inclusion and destruction of the corpus luteum in the area of abscess formation, for it has been shown by Fraenkel that on the integrity of this structure depends the next menstrual loss. The differential diagnosis is made with difficulty; but one point is suggestive, namely, that in tubal gestation the period of amenorrhœa precedes the onset of symptoms, whilst in tubo-ovarian abscess it is coincident with, or subsequent to, it.

Franklin Martin[5] reports three cases of **Hetero-transplantation of the Ovaries**, in which portions of the healthy ovaries of one patient were implanted into the broad ligaments of another who had previously undergone bilateral öophorectomy. In one case the nervous symptoms of a premature menopause at once disappeared, whilst in two some vaginal loss occurred at periods of thirty days for some while after. He also reports five other cases, in which small portions of apparently normal tissue from ovaries resected for extensive cyst formation were implanted into the broad ligaments of the same patients. In four cases a continuance of the menstrual function occurred. This is in accordance with the experiments of Taddei,[6] who found that in rabbits the implantation of portions of their own ovaries into the cellular tissue of the broad ligaments did not affect either the histological character of the ovarian tissue, or the function of ovulation.

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OXALURIA. (*See* URINE.)

OZÆNA.

(*Vol.* 1906, pp. 20, 26)—**Forman**, applied to the mucous membrane of the nose, either as a watery spray or as a steam inhalation, has proved beneficial. This is due to its breaking up into menthol and formaldehyde. **Iodic Acid**, in a 1–500 watery solution, is an excellent deodorant.

PANCREAS, SURGERY OF.

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Gradually evolved by way of the surgery of the biliary tract, it cannot be said that pancreatic surgery has yet a very firm foundation of pathology and symptomatology. In the majority of cases lesions of the pancreas are only suspected before the abdomen is opened ; and even the urinary test of Cammidge, hailed by many surgeons as the panacea for their diagnostic difficulties, has been recently assailed by Schroeder[1] as unscientific, insufficient, and occasionally fallacious. Chauffard (cited by Dieulafoy),[5] also considers it "insufficient." It will be remembered that Cammidge found this reaction positive in 82 per cent of cases of pancreatic disease examined by himself, the negative cases all being far-advanced pancreatic cancers ; but that the exact nature of the body, the presence of crystals of which in the urine, when properly treated, renders the test positive, has not yet been certainly determined, save that in one case Cammidge determined that it was pentose. Schroeder writes : "The apparent value of the pancreatic reaction in the urine makes it reasonable and of interest to reflect on the nature of the conditions that may give rise to this manifestation. The proved results so far obtained would suggest, (1) That inflammatory conditions in the pancreas give rise to the reaction. (2) We may infer that chronic pancreatitis *per se* does

not give rise to the condition, because the reaction disappears when the cause, such as gall-stones in the common duct, has been removed, the infiltration of the gland, the mark of the chronic inflammation, remaining. The reaction, therefore, cannot be said to be the direct result of the chronic pancreatitis, but rather of a functional disturbance coincident with the existence of causative factors. (3) It has been shown that pancreatic tissue contains a larger amount of pentose-yielding material than any other tissue in the body. Therefore, disintegration, as in cancer and abscess, may lead to subsequent excretion of pentose. (4) Pancreatic disturbance may lead to incomplete combustion and excretion of substances of the nature of aldehydes and ketones. (5) In the presence of fat necrosis, glycerin products, incompletely oxidized, may give the reaction. (6) Impaired pancreatic digestion in the intestines may lead to the absorption of certain substances that give the reaction." Schroeder therefore concludes that the reaction is not pathognomonic for disease of the pancreas, in the clinical sense.

Acute Hæmorrhagic Pancreatitis.—Brewitt[2] reports a case of recovery after drainage of the pancreas for this condition. The original diagnosis had been appendicitis, and as the patient was a youth of sixteen years, the idea of the existence of pancreatitis was not even entertained. Brewitt calls attention to the remarkably rapid recovery made by this patient from the collapse present before operation, and urges that surgeons should be less timid in undertaking operation when this lesion is suspected. He quotes only three other cases of acute hæmorrhagic pancreatitis in which operation was attended by recovery. It should be noted, however, that Dieulafoy, cited below, quotes from Lenormant and Lecène six instances of recovery after operation for hæmorrhagic pancreatitis.

Chronic Pancreatitis.—Vautrin[3] discusses this subject in an elaborate article. He holds that while acute pancreatitis is more frequently the result of infection through the blood-stream, yet the chronic form of the disease usually arises by an ascending infection from the duodenum; he admits, however, that an attenuated hæmatogenic infection may cause chronic pancreatitis. The difference in the anatomical and physiological features of the biliary apparatus and the pancreas accounts, he thinks, for the fact that the same infection may cause in one fairly rapid lithogenous changes, with well-defined symptoms, while in the other a latent sclerosing process is set up which may give no manifestations of its existence for years. But owing to the relation of the excretory ducts an angiocholitis may exist independently of an angiopancreatitis, and *vice versa*. He quotes Charpy as stating that, among forty-seven specimens examined, in twenty-two cases the two ducts (biliary and pancreatic) opened into the duodenum by separate orifices. The pathogenesis of pancreatitis by way of the duct of Wirsung, when associated with cholelithiasis, is well summed up by Ebner, who states that the effects of lesions of the ampulla of Vater on the pancreas are at first mechanical; then chemical, by modification

of the composition of the fluid secreted; and finally infectious, when bacteria commence their work. A third way in which pancreatitis may develop is by extension from neighbouring structures—stomach, duodenum, liver, lymph-nodes, etc. Whether biliary lithiasis is to be considered a cause of pancreatitis, or whether both are to be considered as due to the same cause, cannot readily be determined, but the frequency with which they are associated is very generally recognized, and the rarity of pancreatitis alone is well known. Quénu and Duval collected 118 cases in which the two affections co-existed, and Kehr states that pancreatitis exists in 33 per cent of cases of gall-stone disease. The duct of Santorini, protected by no sphincter, affords another channel of infection from the duodenum; and it has been suggested that the duodenal contents become more virulent when from biliary disease the normal bile is no longer discharged into the upper intestine.

W. J. Mayo[1] reports that among 168 operations for pancreatic disease in his experience, 81 per cent of the cases were due to or accompanied by gall-stones. In 268 operations upon the common and hepatic ducts, the pancreas showed disease in 18·6 per cent, against 4·45 per cent where the gall-bladder only was involved.

Treatment.—Although isolated cases of chronic pancreatitis do exist without coincident disease of the biliary tract, yet in the immense majority of cases they are both present, and to cure the pancreatitis it is requisite for the surgeon to remove its probable cause—the biliary lesion. Quénu and Duval, according to Vautrin, collected sixty-two operations for chronic pancreatitis, as may be seen in the accompanying table:—

	Cases	Deaths
Cholecystostomy	12	2
Duodeno-choledochotomy	3	—
Choledochotomy	6	2
Cholecystostomy and choledochotomy	18	2
Cholecystectomy	3	1
Cholecystectomy and choledochotomy	3	—
Cholecystectomy and drainage of choledochus	10	1
Cholecystendysis	1	—
Cholecystenterostomy or cholecystogastrostomy	6	2

Vautrin points out that while comparatively simple operations (cholecystostomy, and even mere exploratory laparotomy) may suffice for the cure of the less-advanced cases of chronic pancreatitis, in those of long standing it is better to drain the hepatic or the common duct for several weeks. He also attributes great value to separation of adhesions around the head of the pancreas by means of mobilization of the duodenum, and to prolonged drainage of the sub-hepatic space and the retroperitoneal tissues for the purpose of curing pericholecystitis and peripancreatitis. In one case he had to wait nine months for the choledochus to become permanently patent and for the biliary fistula to close; but cure was then complete. He therefore warns against resorting to further operative treatment unnecessarily

soon, and he expresses his disapproval of Desjardin's dictum that in three weeks, or a month at most, the biliary sinus, following drainage of the hepatic duct, should close; Kehr and Körte had to wait three or four months for the normal course of the bile to be restored. If, however, the dejections remain constantly acholic for several weeks, he thinks it useless to hope for restoration of the normal channel. To hasten restoration of patency of the bile-duct, he adopted in one case the plan of liberating it from its adhesions in the pancreas by the aid of the thermo-cautery, after mobilization of the duodenum. If the biliary fistula persistently declines to close, the surgeon must at a second operation restore the normal channel for the excretion of the bile by some form of biliary and intestinal anastomosis; or if the pancreatitis is hopelessly advanced, such an operation may be undertaken at the first intervention. As the gall-bladder is in these cases, according to the Courvoisier-Terrier law, usually sclerosed and very small, cholecystoduodenostomy may be as difficult as hepatico- or choledochoduodenostomy. Vautrin prefers one of the latter operations. For the treatment of chronic pancreatitis *without biliary lithiasis*, Vautrin recommends treatment of the pancreas without interference with the bile tracts. In some cases due to perigastric adhesions, the operations of gastrolysis, gastroenterostomy, or partial gastrectomy will bring about a cure of the pancreatic lesion. In other cases drainage of the retropancreatic tissues, of the lesser peritoneal cavity, or even incision and drainage of the pancreas itself, may be preferable. Partial pancreatectomy, while justifiable in certain cases of malignant disease, he thinks too severe an operation for chronic pancreatitis.

Dieulafoy,[5] in his recent volume of the medical clinique of the Hôtel-Dieu, devotes an interesting chapter to the "pancreatico-biliary syndrome," and to the "*drame pancréatique*." He recites several case histories, showing the relation of biliary lithiasis to pancreatitis, and points out that even after a solitary calculus has been passed, the jaundice may persist from the pancreatitis. He has collected fifteen cases of associated biliary and pancreatic disease, in addition to the 118 collected in 1905 by Quénu and Duval. He urges surgical treatment as the only cure. Speaking of acute forms of pancreatitis under the term "*drame pancréatique*," Dieulafoy calls attention to the two anatomical signs—fat necrosis, and pancreatico-peritoneal hæmorrhage—by which it is manifested. The ultimate cause of the fat necrosis is unknown; its immediate cause is the chemical action of the steapsin of the pancreatic juice; it is especially noteworthy that this fat necrosis may affect the thoracic (pleura, pericardium) as well as the abdominal structures, and that it may be unaccompanied by peritonitis or any trace of peritoneal infection. In many cases fat necrosis is accompanied by a hæmorrhagic exudate; the latter never exists without fat necrosis. "On opening the abdominal cavity there flows out a saguinolent liquid. Hæmorrhagic foci, circumscribed or diffused, superficial or deep, may occupy the pancreas, the neighbouring tissues, the subperitoneal cellular tissue, the omentum, mesentery, and perirenal fat.

It is not blood from the pancreas diffused here and there, but a hæmatoma of the pancreas, a hæmatoma of the omentum, of the mesentery, etc." This form of hæmorrhage he has named pancreatico-peritoneal purposely to distinguish it from some hæmorrhages of the pancreas associated with suppuration, gangrene, or lithiasis of the pancreas; these latter forms being grouped together under the general name of hæmorrhagic pancreatitis. The former class of hæmorrhages is not due to an infecting process, because no trace of infection can be found, but to a chemical or toxic process, caused by the pancreatic ferment trypsin. Wiener, he says, in 1903 collected twenty-five cases of fat necrosis without pancreatico-peritoneal hæmorrhages; all of these patients died but one, who recovered after operation. Dieulafoy quotes cases from the literature illustrating his views, and giving examples of (1) Fat necrosis without peritonitis; (2) Fat necrosis with pancreatico-peritoneal hæmorrhages, which he classes thus, although most of them were reported as cases of acute hæmorrhagic pancreatitis, because careful examination has convinced him that they are not instances of the latter condition, but of pancreatico-peritoneal hæmorrhages occurring in the course of *chronic* pancreatitis. Among thirty-six cases of hæmorrhagic pancreatitis analyzed by Lenormant and Lecène, six patients were saved by operation. Dieulafoy urges exploratory laparotomy, even if a certain diagnosis cannot be reached, when symptoms suggestive of the "*drame pancréatique*" arise.

Carcinoma of the Pancreas.—Dieulafoy (*loc. cit.*) notes the remarkable fact that not one of forty-five patients with cancer of the head of the pancreas died as the result of what he has graphically described as the "*drame pancréatique*"—that post-mortem examination never showed either fat necrosis or pancreatico-peritoneal hæmorrhages. Even in eleven patients with cancer of the ampulla of Vater, causing the "biliary-pancreatic syndrome," with retention of bile and pancreatic juice, there was not one instance in which autopsy revealed either hypertrophic or stenosing pancreatitis, or fat necrosis, or pancreatico-peritoneal hæmorrhages. "The patients died of their cancer, but were never overtaken by the '*drame pancréatique*.' We find ourselves here," says Dieulafoy, "in front of a situation so paradoxical that it seems inexplicable. Moreover, in only a single case of pancreatic lithiasis could fat necrosis or pancreatico-peritoneal hæmorrhages be detected; and in that case there were also many calculi in the gall-bladder, with infectious biliary lithiasis." Dieulafoy frankly confesses his inability to draw any conclusions from these facts at present.

Operative Treatment of Carcinoma of the Pancreas.—

1. **Cholecystenterostomy.**—Swain,[6] discussing operative interference, concludes that as the only portions of the pancreas in which resection is possible (body and tail) are very rarely affected by carcinoma, and that as in this situation the growth produces no symptoms until very far advanced, and as, moreover, cancer of the head of the pancreas, which manifests itself with reasonable promptitude by obstructive

jaundice, is practically inoperable, operative treatment must be chiefly palliative. He reports two cases of cholecystocolostomy, and one of cholecystoduodenostomy for obstructive jaundice due to this cause. The patients were temporarily relieved, but died at periods of eight, five, and eleven months respectively after operation, or an average of forty-four weeks from the time of commencement of the jaundice. He quotes Murphy's statistics, showing, up to 1897, ten deaths in twelve cases of cholecystenterostomy for malignant disease, a mortality of 83·3 per cent, while Mayo Robson had five deaths among seven operations. These three successful operations are all that Swain himself has done. In non-malignant cases, he says Murphy did this operation sixty-seven times, and Mayo Robson seventeen times, without a single death in either series ; so that the high mortality among malignant cases cannot be held to depend on the operation *per se*. He urges, therefore, that this operation should be undertaken early, certainly before the yellow tint of the patient's skin has deepened into the "black jaundice" always indicative of an advanced degree of cholæmia. In his own patients the average duration of the jaundice before operation was eight weeks. Another argument in favour of early operation is that the diagnosis of malignancy may be erroneous, and a prompt operation may suffice to cure the pancreatitis, if benign.

Cholecystogastrostomy.—Mariotti[7] has collected forty-five of these operations, of which twenty-one were done by Kehr and five by Jaboulay. He thinks it should be employed only when other forms of biliary-intestinal anastomosis prove impossible. Fourteen (31 per cent) of the forty-five patients died ; there were three permanent cures, all in cases of benign lesions. In all the cases, even those which were malignant in nature, digestion was accomplished in a normal manner, and the icterus and cachexia were relieved.

Pancreatectomy.—Sauvé[8] has made a painstaking and complete contribution to this subject, based on physiological, anatomical, and surgical premises. To the many objections urged by Villar and others against the attempt at any radical treatment for cancer of the pancreas, Sauvé calls to mind that even in unpremeditated pancreatectomies, done without a well-ordered technique, and with no previous experience, the successes have been more numerous than the failures. The patients of Codivilla, Billroth, Francke, and Biondi recovered ; those of Terrier and Mayo Robson died ; and though the duration of life after palliative operations has occasionally been longer (ten to fourteen months after cholecystenterostomy) than after pancreatectomy (six months), yet the total number of the radical operations is very small. "It has been our opinion," writes Sauvé, "that when the surgeon shall possess a carefully-ordered technique for total excision of the head of the pancreas (*'pancréatectomie céphalique totale'*), when he shall have clearly recognized the indications for the operation, the successes will be more numerous, and above all, more lasting. Cancer of the head of the pancreas is perhaps that form of cancer which kills its patients in the shortest space of time ; its average duration does not exceed

six or seven months, and it is frequently accompanied by intolerable pain. Are we totally helpless against such an ending? Must we, in advance, make no attempt to alter this state of affairs? Is it right that at a time when surgical technique is bettering itself from day to day we should close the only door of escape possessed by these patients, condemned to a rapid and excessively painful death?" In regard to the *physiological* objections to pancreatectomy, Sauvé points out that the functions of the pancreas are so numerous that no one function can be considered indispensable, and that its functions are frequently, if

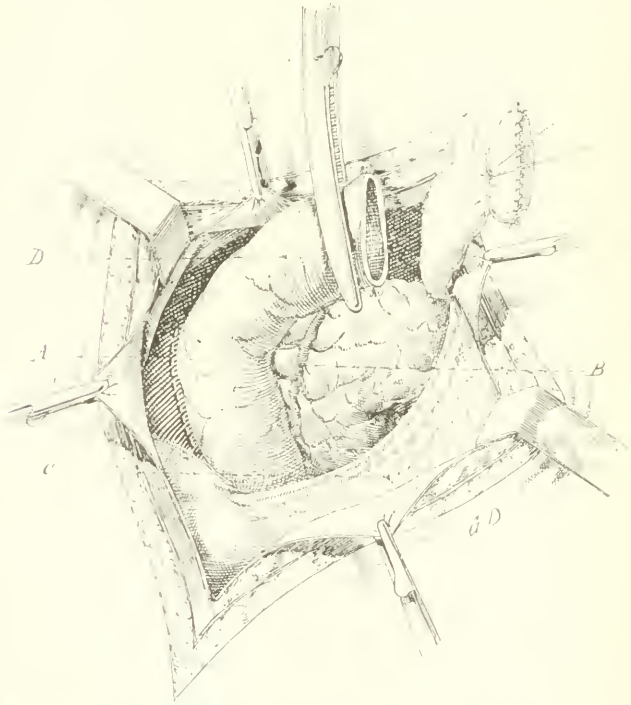

Fig. 53.—The pylorus is divided. The clamp, placed upon the duodenum (*D*) and drawing it forward, gives a large exposure of the pancreatic region. The mesocolon is shown at *C*, and at *A* the paraduodenal incision of Wiart.

not completely, supplemented by those of other organs. Although at present total pancreatectomy appears to be inevitably fatal, he suggests that it is so merely because the supplemental functions of other organs have not time to develop, when the pancreas is removed by a single operative act. He has successfully removed the entire pancreas from a dog, with survival for sixteen days. For details of his numerous experiments the original article should be consulted. An accurate study of the surgical anatomy of the head of the pancreas is next

presented. Sauvé dwelling especially on the surgical value of the "*fascias d'accolement rétro- et pré-pancréatiques*" which permit of bloodless mobilization of the duodenum and the head of the pancreas. He classes cancers of the head of the pancreas as: (1) Superficial, having their seat far from the pancreatic and biliary ducts; (2) Deep, those which attack the pancreatic ducts almost at once, and soon invade the bile-ducts; and (3) Cancers of the papilla of Vater, though

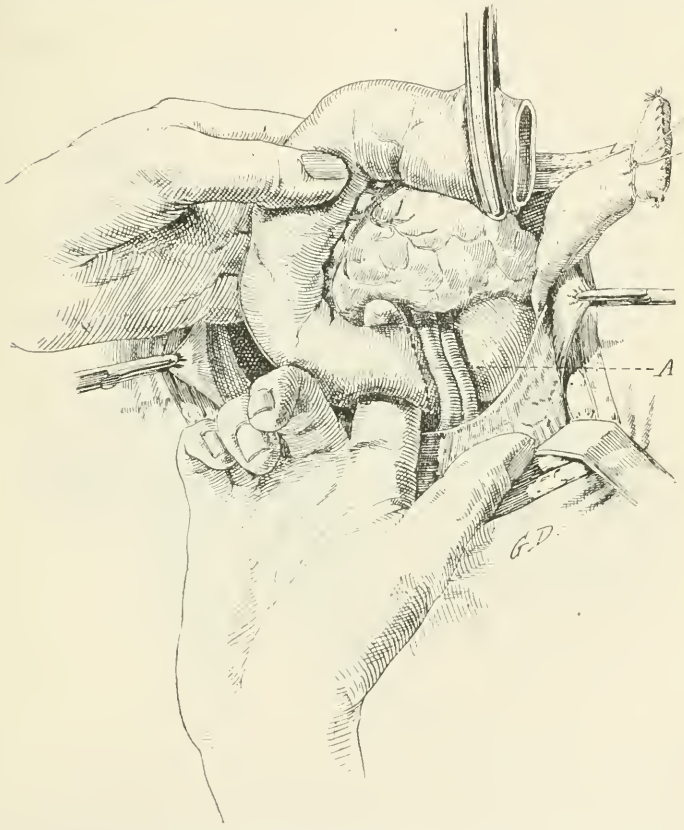

Fig. 84.—The pancreas has been freed before and behind. The right index finger separates the duodenum and the pancreas immediately to the right of the mesenteric vessels. At *A* is shown the inferior section of the duodenum. The mesocolon is turned back.

these latter are not usually included among pancreatic cancers. Some interesting details of surgical pathology are given, including the rapidity and manner of metastasis, and the state of the rest of the organ when cancer affects its head. From these he concludes that as cancer primarily affects the head in the large majority of cases, and as extension to the pylorus and duodenum occurs early, the radical operation

indicated is pyloro-duodeno-pancreatectomy; furthermore, that, in view of the anatomical conditions, this is the only radical operation possible. Early diagnosis is necessary to render such an operation of any value: and the classical signs of cancer of the pancreas are usually evidences of inoperable growths. In reality the signs vary with the seat of the cancer, whether superficial, deep, or Vaterian. The superficial is nearly always inoperable, because no signs are produced until

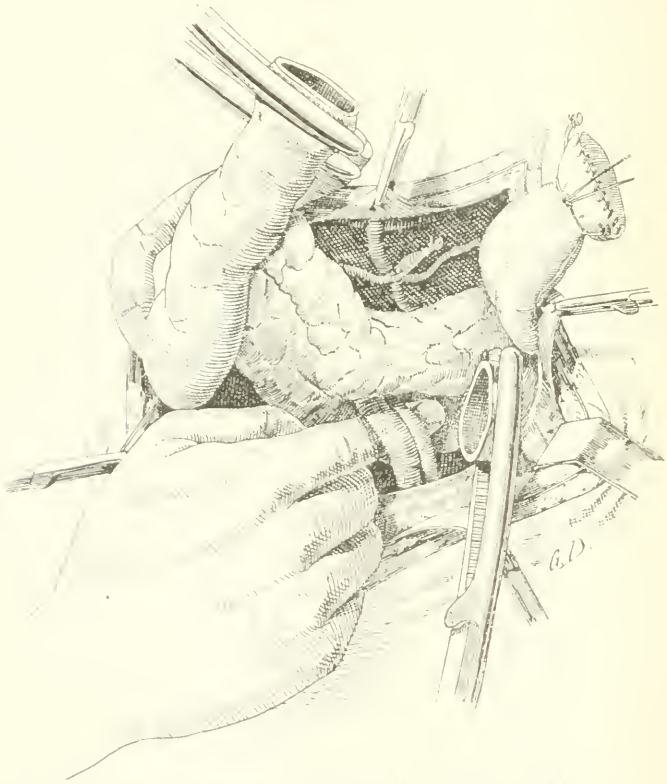

FIG. 83.—The two clamps placed on the upper and lower sections of the duodenum bring out more clearly the resected duodenum and the head of the pancreas, while the right index finger, which carefully frees the mesenteric vessels from the groove formed by the tail of the pancreas.

wide extension is present: no pain, because the growth is far from the solar plexus: no vomiting, because it is far from the duodenum; no jaundice, because it is far from the bile-ducts; no signs of pancreatic insufficiency, because the pancreatic ducts are not affected. The deep form of pancreatic cancer is characterized by pain and pancreatic insufficiency, without jaundice until the last stages; while cancer near the ampulla of Vater shows itself by the abrupt, painless development

of jaundice, which constantly deepens, and is accompanied by signs of pancreatic insufficiency. Any of the three forms described may eventually invade the entire head of the pancreas, and ultimately produce the same symptoms.

Sauvé collects eleven cases of cephalic pancreatectomy of which the details are known, and refers to five others merely mentioned in journals. Of these eleven patients, seven survived the operation, and three patients were in good health a year later, but these three did not

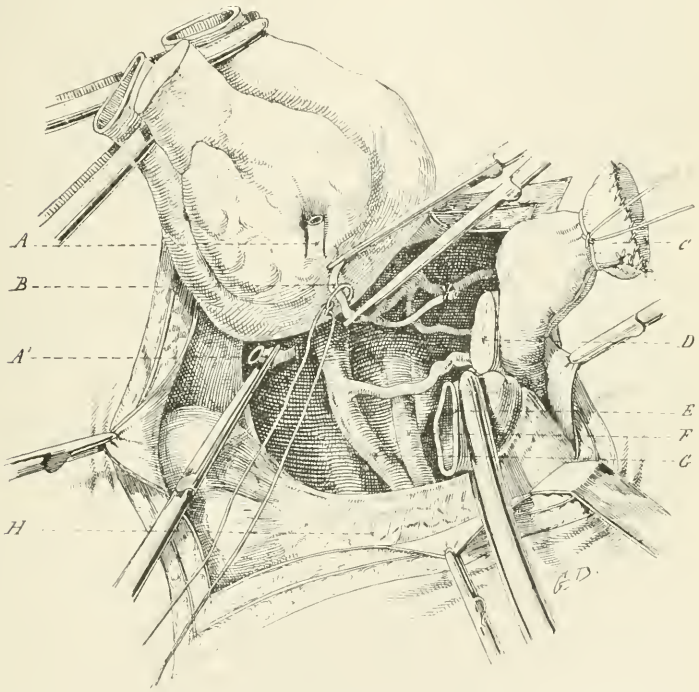

Fig. 86.—The mesenteric vessels and the portal vein have been freed. The bile-duct has been divided at *A* and *A* ; the gastroduodenal artery (*B*) is to be ligatured and divided ; the "bascule" of the duodenopancreas is accomplished after section of the isthmus of the pancreas, the stump of which is at *D*. The operation being completed, one notices that the mesenteric vessels *F* and *G*, and the mesocolon *H*, are intact. It only remains to close the lower part of the duodenum *E*, and to make a gastro-enterostomy and a cholecystenterostomy or choledocho-enterostomy.

have cancer. Of all these operations, that of Codivilla was the most ideally complete : cephalic duodeno-pancreatectomy, with gastro-jejunostomy in Y, and cholecystenterostomy ; his patient lived twenty-four days, and succumbed then to the pre-existent cachexia. While simple excision of the head of the pancreas without removal of the duodenum will suffice for benign tumours, the surgeon must choose, in the presence of cancer, between purely palliative operations (chole-

cystenterostomy, etc.) and radical extirpation of the growth, duodenopancreatectomy.

The *technique* of duodenopancreatectomy is systematized by Sauvé in six steps: (1) Laparotomy, by a modified Kehr incision, and exposure of the operative field; (2) Ligation of pyloric and gastroduodenal arteries, and section of the pylorus (*Fig.* 83); (3) Mobilization of the duodenum; (4) Section of the transverse duodenum just to the right of the superior mesenteric vessels (*Fig.* 84); (5) Separation of the so-called "little pancreas" from behind the superior mesenteric vessels, and of the head of the pancreas from the portal vein (*Fig.* 85); (6) Section of the head from the tail of the pancreas; second ligation of gastroduodenal artery; ligation and section of choledochus (*Fig.* 86).

These steps terminating the operation of duodenopancreatectomy proper, there still remain to do the supplementary operations of gastroenterostomy and cholecystenterostomy or some of their modifications. Finally, the sectioned tail of the pancreas is to be fixed in the abdominal wound, to prevent fat necrosis; as the union of the minute pancreatic duct to the intestine is nearly an impossible operation. In a postcript the author notes that since completing his work in December, 1906, other cases of pancreatectomy have been recorded by Cordoy, Mauclaire, Villareal, Moynihan, and Cunéo. Except Cunéo, who adopted the method of Tuffier, all seemed to recognize the fact that duodenopancreatectomy is the proper radical operation for malignant tumours of the head of the pancreas.

It is not possible to give in these pages a complete analysis of this valuable monograph, and the reader who is interested in the subject is earnestly advised to study the original work in full.

Cyst of the Pancreas.—Schmidt[9] reports a case in which he extirpated a cyst of the pancreas by way of the gastrocolic omentum; drainage was provided for by a left lumbar incision, as well as through the abdominal wound. The succeeding pancreatic fistula discharged much less when the patient was fed according to Wohlgemuth's plan on antidiabetic diet and frequent small doses of sodium bicarbonate.

Rupture of the Pancreas.—Hohmeier[10] adds a sixth case of recovery after operation for complete transverse rupture of the pancreas. The gastrocolic route was adopted, the ends of the pancreas were sutured to each other, and the wound tamponaded. The resulting fistula remained open for many months; finally Wohlgemuth's treatment by antidiabetic diet was adopted, and the fistula closed in ten days; it opened again when the patient resumed her normal diet, but again closed in fourteen days, when she returned to Wohlgemuth's antidiabetic treatment, and remained permanently dry.

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PANCREATITIS. *Robt. Hutchison, M.D.*

This subject was considered at some length in the last *Annual*, but it is one of such interest and importance that no excuse is needed for returning to it again.

Acute Pancreatitis.—In opening a discussion on this disease at the meeting of the British Medical Association in 1907, Prof. Osler[1] said that the history of our knowledge of pancreatic disease might be divided into three periods—the time when the pancreas was believed to be of little if any importance, the time when the work of Fitz appeared, and the later times of the discoveries of the influence of pancreatic ferments and the relation of the pancreas to the production of diabetes. He recognized two groups of cases of acute pancreatitis —one in which there was distinct enlargement of the gland, which might, however, be partly due to hæmorrhage into its substance; and another in which the gland was in a state of suppuration or necrosis. It was frequently very difficult to say whether the hæmorrhage had followed or preceded the inflammation. An important distinctive anatomical point, however, was that in the acute pancreatic hæmorrhage cases there was no fat necrosis. There were three main causes of acute pancreatitis: (1) A mechanical cause, as a calculus in the common bile-duct leading to bacterial infection—a calculus in the pancreatic duct was, however, rare; (2) A chemical cause, as bile, gastric juice, or duodenal contents; and (3) An infective cause—most important of all—the various pathogenic organisms living in the intestine. It was well known that the pancreatic juice had bactericidal properties, and it was not until stasis had occurred that infection resulted. The frequency of the association of gall-stones with acute pancreatitis was very remarkable—it occurred in nearly half the cases; an especially favourite site for the gall-stone was the ampulla of Vater. A stone might, however, be present in Vater's ampulla for years without giving rise to suppuration, the patient merely having periodically rigors, slight pyrexia, jaundice, and pain. Still, it was in these cases where there was stasis of the bile that acute pancreatitis was liable to develop. It was probable that bile alone, independent of bacterial invasion, was unable to set up the disease. A very large number of the cases showed gastro-intestinal disturbance, and a large proportion of these were alcoholic; the condition present was probably duodenitis, with blocking of the duct. Among the less common causes of acute pancreatitis were mumps and enteric fever.

Having regard to diagnosis the cases might be arranged in two groups—the acute and subacute. Acute pancreatitis afforded one of the severest forms of the "acute abdomen," exhibiting a sudden prostrating agony referred to the abdomen, recurring in paroxysms, quickly followed by vomiting, similar to that of an acute intestinal obstruction affecting the upper part of the small intestine, with intense shock, frequently a diffuse lividity, with tenderness sometimes from the onset over the upper part of the abdomen, and sometimes a diffuse swelling might be appreciable: this, however, was often obscured by

the rapid distention of the abdomen. It must be said that the diagnosis of acute pancreatitis was often impossible. The very same symptoms might be found in an attack of severe hepatic colic or in acute perforation of the stomach. In the diagnosis the history was of the greatest significance, especially one of alcoholism in middle-aged men or a record of gall-stones, and then the sudden severe symptoms. Death occurred as a rule in three or four days from the onset. In the suppurative cases the symptoms were not at first so acute: the pain was less urgent, but fever was present and a swelling might be found between the ensiform and the umbilicus, or extending to the left and reaching to the flank. The urine and stools were characteristic of pancreatic disease. The stools might contain fragments of necrotic pancreas or the typical excess of fat.

In reference to prognosis, taking a large series of cases, 90 per cent of those not operated on died, and of those operated on more than 50 per cent recovered. The cases in which gall-stones were the cause were particularly fatal.

Diagnosis of Pancreatic Disease.—Cammidge[2] says that, owing to the situation of the pancreas behind the stomach and in front of the spinal column, the physical signs of disease of the gland are often difficult to make out, particularly in stout people and in the early stages of the disease. The digestive symptoms are at times indistinguishable from those due to other causes, and are in some instances so masked by associated conditions that by clinical examination alone it is impossible to prove that the pancreas is the chief cause of the trouble. The relation of the pancreas to internal carbohydrate metabolism is now well recognized, and modern investigation has shown that about 70 per cent of cases of diabetes are due to disease of the pancreas. Glycosuria is, however, a comparatively rare symptom of pancreatic trouble, and it occurs at such a late stage that to wait for its appearance is to throw away the patient's chance of cure. Maltosuria, pentosuria, indicanuria, and lipuria, all of which have been suggested as indications of pancreatic disease, are so rare and inconstant that no reliance can be placed upon them in practice. From a general consideration of the history and symptoms of the case there is, however, often a probability, or strong suspicion, of some more or less serious interference with the functions of the pancreas, but in the absence of any definite indication by which this may be verified, the diagnosis must remain in doubt. It is in such cases that Cammidge's "pancreatic reaction" in the urine is of value.

The original method of performing the "pancreatic reaction," published in 1904[3] has now been replaced by the "improved or C-pancreatic reaction," described in a paper read before the Royal Medical and Chirurgical Society on March 13th, 1906.[4] The improved method is much more definite in its results than that first described, and is independent of the experience of the observer for its interpretation. The presence or absence of pancreatitis is now indicated by the result of a single preparation, and does not, as formerly, depend upon the

difference in the amounts of the precipitates obtained in two parallel experiments. As it is a somewhat complicated process, however, it still requires some experience and skill for reliable results to be obtained.

In a recent summary of the results of this reaction, Cammidge maintains that, if properly performed, it is of great help in diagnosis. From the experimental side, the diagnostic value of the test has been confirmed by Felix Eichler,[5] who obtained a positive reaction with the urines of three dogs in which acute pancreatitis had been experimentally produced, whilst the urines of normal dogs gave no reaction. Chalmers Watson,[6] in a paper based upon over 250 analyses, also arrives at a favourable opinion of the pancreatic reaction, and states his conclusions regarding it as follows :—

"My results confirm the conclusion arrived at by Mayo Robson and Cammidge, that there is a definite and important relationship between the pancreatic reaction in the urine and disease of the pancreas. My results differ from those of Cammidge in so far that I have recorded a higher percentage of positive results in cases similar to those that may have been included in that author's list of control cases. Cammidge found in a group of cases described as miscellaneous—other than those having a direct surgical interest in relation to disease of bile-ducts and pancreas—that four only out of ninety-two gave a positive reaction. The higher percentage of positive results recorded in my series may possibly be due to the fact that I made use of many serious medical cases of a nature commonly associated with advanced arterial disease, and chronic catarrhal conditions in the intestinal tract, conditions that are frequently attended with degenerative or inflammatory changes in the pancreas and other glands. My results lead me to divide the cases in which the pancreatic reaction was present in my series into the following groups :—

"1. In which there was definite clinical or pathological evidence of serious organic disease of the pancreas—for example, acute and chronic pancreatitis, usually associated with disease of the bile-ducts.

"2. In which the reaction in the urine is associated with pronounced arterial sclerosis, a condition usually accompanied by more or less sclerosis in different glands.

"3. In which the reaction is dependent on congestion and catarrhal conditions of the gland-ducts and substance, with associated toxæmia —for example, advanced heart disease, appendicitis, pneumonia, malaria, and the like.

"This division is, it is hardly necessary to add, somewhat arbitrary, as most cases are in all probability of mixed origin. If these facts are kept in view, and this urinary reaction is carefully studied along with the other clinical features of a case, I have no hesitation in saying that this new test will prove of great value both to physicians and surgeons in the diagnosis and treatment of pancreatic disease."

Cammidge (*loc. cit.*) considers that it is always advisable to check the results of the urinary examination by an analysis of the fæces, and in cases of suspected malignant disease it is essential for a correct diagnosis

that this should be done, for although the improved pancreatic test gives no crystalline deposit in about 75 per cent of cases of cancer of the pancreas, in the remaining 25 per cent a more or less marked reaction is obtained, owing apparently to the inflammatory changes in the gland that accompany the rapid spread of the growth and blocking of the pancreatic duct. Mere inspection, and even microscopical examination, of the stools are not enough: the actual percentage by weight of the total fat—saponified and unsaponified—in a carefully dried specimen must be determined, and the residue, after extracting with ether, be examined for stercobilin, preferably by the methods described by him in 1905.[7] In all cases of advanced and well-marked pancreatic disease there is, even on an ordinary mixed diet, a considerable excess of unabsorbed fat, often as much as 75 per cent of the dry weight, but more important still the unsaponified fats, instead of being approximately equal to the saponified fats as in normal fæces, are in considerable excess. In cases of simple jaundice not associated with pancreatic disease, the reverse is found, the saponified fats being here in excess. The total fats in cancer of the pancreas may reach 95 or 98 per cent of the dry weight. In malignant disease of the head of the gland—the most common type—the fæces are quite free, or at the most show but traces, of stercobilin at the time when the patient usually comes under observation, whereas in obstruction of the biliary passages by gall-stones, on the other hand, some stercobilin can nearly always be found, although the fæces may appear quite white to the naked eye.

Schlecht[8] describes a simple method of testing the activity of the pancreas in health and disease. It is carried out as follows: The patient to be examined receives in the morning while fasting, a glycerin enema. After the bowels have acted he is given a test-meal; two hours later he receives a full dose of calomel. Usually two or three liquid stools result which are alkaline or only faintly acid in reaction. If strongly acid, the stool is rendered alkaline by the addition of weak soda solution. Should it be of gruel-like consistence, a little glycerin is also added. Small drops of the stool are then deposited on a serum-plate and kept for twenty-four hours at a temperature of 55–60° C. If trypsin be present, a greater or less degree of liquefaction results. Schlecht claims that this test is both easy to carry out and quite trustworthy.

References.—[1]*Brit. Med. Jour.* Oct. 26, 1907; [2]*Clin. Jour.* April 1, 1908; [3]*Lancet*, Mar. 19, 1904; [4]*Med.-Chir. Trans.* vol. lxxxix, and *Brit. Med. Jour.* May 19, 1906; [5]*Berl. klin. Woch.* No. 25, 1907; [6]*Brit. Med. Jour.* April 11, 1908; [7]*Ibid.* Oct. 28, 1905; [8]*Münch. med. Woch.* April 7, 1908.

PARAPLEGIA.

(*Vol.* 1900, p. 479)—In paraplegia complicating spinal caries, the possibility of its being due to pressure which might be removed by the operation of **Laminectomy** should always be borne in mind.

PARALYSIS. (*See* Aphonia; Bulbar Paralysis; Eyelids, Diseases of; Facial Hemispasm; Poliomyelitis.)

PARATYPHOID FEVER. *E. W. Goodall, M.D.*

In a very full paper, with many references, Lieut.-Col. Birt, R.A.M.C.,[1] discusses various points in connection with typhoid and paratyphoid fevers. It has been pointed out in previous numbers of the *Annual* that paratyphoid fever is a disease which clinically is exactly like typhoid fever of a mild form, due to a bacillus, the paratyphoid bacillus, which belongs to the typhocoli group of bacteria. The author concludes: (1) The typhoid bacillus may be an inhabitant of the bile passages or alimentary canal without producing illness. (2) When the typhoid bacillus invades the blood it may cause trivial symptoms with short pyrexia only. (3) Paratyphoid infections cannot be distinguished clinically from enteric. (4) Paratyphoid infections are less common than typhoid. (5) A negative serum reaction with the enteric bacillus, or a positive reaction with a paratyphoid bacillus, is not sufficient to justify a diagnosis of paratyphoid fever. (6) In every febrile case blood cultures should be made at once for diagnostic, prognostic, and therapeutic purposes.

Reference.—[1]*Jour. R.A.M.C.* Aug. 1907.

PAROTID GLAND, EXCISION OF. *Priestley Leech, M.D., F.R.C.S.*

Carwardine[1] records a case of removal of the parotid gland with preservation of the facial nerve. He first dissected out the nerve with its ramifications; it was then held out of the way by a loop of catgut and the parotid completely dissected out. Temporary facial paralysis followed the operation, but in two months this had disappeared. The cosmetic result is worth the expenditure of the time and care which the operation entails.

Reference.—[1]*Lancet*, Sept. 28, 1907.

PATELLA, FRACTURE OF. (*See* Fractures.)

PERICARDITIS. *John Cowan, D.Sc., M.D.*

There has been a considerable difference of opinion as to the position of the heart in pericarditis with effusion, a point which is of importance in cases where surgical interference is required. Calvert,[1] from the examination of frozen sections in two cases of pericardial effusion, draws the following conclusions:—"The position of the heart in pericarditis depends upon its size. The size of the heart depends on the degree of distention, or on the amount of blood within it. This amount depends on the stage of compensation. While compensation is maintained, the heart contains a relatively normal amount of blood, and is in a relatively normal position. When compensation fails, the amount of blood delivered to the heart is diminished, and the heart becomes smaller and smaller until collapsed. Its size varies inversely as the pericardial pressure. During this change the heart successively occupies positions varying from normal to . . . . .(one) against the posterior wall of the pericardium. The apex is in a normal position or displaced backwards and slightly to the right, otherwise unchanged. When the pericardial pressure is high, or when compensation is failing, the signs should be:

triangular, area of dullness, high pulse-rate, perhaps pulsus paradoxus, low arterial tension, marked systemic venous congestion, and pronounced pulmonary symptoms."

West[2] states that the respirations may be very rapid in large effusions, sometimes from the pain experienced in full breathing, sometimes from pulmonary congestion due to cardiac weakness, as the heart is almost always dilated. He considers that **Opium** in small doses is often useful. Rheumatic cases rarely require paracentesis. If paracentesis is required, the only safe place for puncture is in the 5th or 6th space between the left border of dullness and the apex impulse, if this can be defined. Dock[3] also recommends this site, or puncture through the left costoxiphoid space. More radical operations may be performed here, too, resecting the 6th and 7th costal cartilages if necessary.

Wenckebach[4] does not consider that the signs of adherent pericardium as commonly described are constant, and the diagnosis is in consequence often incomplete. (Richter,[5] for instance, reports a case where typical pericardial friction was audible four days before death, though the pericardial sac was completely obliterated.) When it is associated, however, with adhesions to the vertebral column, sternum, ribs, and diaphragm, the normal descent of the latter is impeded or prevented, and thoracic expansion is deficient. The inspiratory flux into the great veins is lessened and the cervical veins may be distended simultaneously, while the cardiac output is lessened and the pulsus paradoxus may appear. The normal expansion of the lower part of the sternum is never present, and the liver becomes engorged as the result of the absence of the diaphragmatic descent.

Surgical interference has recently been advocated in chronic cardiac disease of various kinds. It is particularly indicated in such cases as Wenckebach describes, with adhesions to the bony parietes; and the removal of part of the sternum or of the contiguous costal cartilages (cardiolysis: Brauer's operation) relieves the heart's action by the greater freedom ensured during its movements. Such procedures may also be of use in cases of hypertrophied heart in adults. In children the præcordia can bulge forwards, if the heart enlarges, from the softness of their ribs, but this rarely, if ever, occurs in adults, and the increased size of the heart in a thorax of fixed size can only be compensated by compression of the other thoracic viscera.

These operations are not peculiarly difficult, and the results seem promising. Koenig[6] reports a case in which such treatment seemed of value. He states that it is unnecessary to remove all the periosteum to prevent new bone formation, as in his case the anterior chest wall was still soft and yielding when the patient died of miliary tuberculosis two and a half years afterwards. The operation is much less difficult if the periosteum is left. Urban[7] reports a successful case which was operated on in this way. Morison[8] also discusses the question and reports a case.

Rehn[9] discusses the surgery of the heart and pericardium. The

diagnosis of cardiac wounds may be difficult; rapid distention of the pericardium is accompanied by præcordial oppression or pain, especially during inspiration, and exaggerated by pressure over the heart, and pains in the left arm. There is often some abdominal pain, with reflex tension of the upper abdominal muscles, and shortness of breath. The mucous membranes become livid, the cervical veins are distended, and the pulse is small and feeble. Free continued hæmorrhage from an external wound in the cardiac region points to cardiac wounding; frothy blood only indicates hæmorrhage from the interior of the chest. In doubtful cases he recommends an exploratory pericardiotomy. The sites for operation are considered in detail. Of 124 cases where the cardiac muscle has been sutured, forty-nine recovered; while of ten cases where operations were performed without suture, eight recovered. Punctured and bullet wounds showed almost the same results. The pleura only escaped injury from wound or operation in nine cases.' The chief danger next to hæmorrhage is sepsis.

References.—[1]*Johns Hop. Hosp. Bull.* Oct. 1907; [2]*Brit. Med. Jour.* Oct. 26, 1907; [3]*Ther. Gaz.* Feb. 15, 1908; [4]*Brit. Med. Jour.* Jan. 12, 1907; [5]*Berl. klin. Woch.* Ap. 27, 1908; [6]*Centr. f. Chir.* July 6, 1907; [7]*Wien. med. Woch.* quoted in *Sem. Méd.* July 1, 1908; [8]*Lancet*, July 7, 1908; [9]*Med. Press*, Jan. 22, 1908.

PERITONITIS. *Rutherford Morison, F.R.C.S.*

The plan formulated by Murphy for the treatment of general peritonitis has been generally accepted in this country and in America. The principles on which it is based are sound, and improved results are reported all round as having followed its adoption. The most important points are: (1) To stop the leak by suture in the case of gastric or duodenal ulcer, by excision in the case of the appendix, as rapidly and with as little manipulative disturbance as possible; (2) To drain the pelvis with a tube; (3) To keep the patient sitting up, so that poisonous fluids run down into the pelvis, all the time, until convalescent; (4) To dilute the toxins in the blood and peritoneal cavity by continuous rectal infusion.

Murphy[1] agrees with MacCallum that "stomata," or minute openings in the peritoneum connecting the peritoneal cavity and subperitoneal tissues, do not exist. The lymphatic distributions of the serous membrane on the pleural and abdominal surfaces of the diaphragm are closely intimate. It is generally accepted that while fluids and soluble substances are absorbed by both blood-vessels and lymphatics, solid particles (e.g., lampblack, bacteria, etc.) are taken in almost exclusively by the lymphatics.

Peritoneal Absorption depends upon several factors:—(1) Pressure of the abdominal muscles, tonicity and respiratory contraction; (2) Rhythmic pump-like action of the diaphragm: by virtue of its constant contraction and relaxation, fluid and particles are aspirated from the peritoneum and forced onwards; (3) Peristaltic activity, which distributes the fluids evenly and prevents their accumulation at the lowest point in the pelvis; (4) Vitality of the peritoneum.

Factors hindering Absorption are:—(1) Subperitoneal infiltration, lymphatic "coffer-damming"; (2) Venous engorgement; (3) Diminished peristalsis, which allows the fluids to gravitate to the pelvis; (4) Lessened diaphragmatic movement by diminished or shallow respirations;. (5) Lowered abdominal temperature; (6) Drying of the peritoneal endothelium, e.g., by exposure at an operation; (7) Lowered intra-abdominal pressure, as after a laparotomy; (8) Certain positions of the body, which favour gravitation toward the pelvis.

Factors favouring Absorption.—(1) Abrasion or exfoliation of the endothelium under certain conditions; (2) Exposure of underlying vessels by tearing of peritoneal adhesions; (3) An acceptable material e.g., saline solution, certain bacteria, ptomaines, etc.; (4) Pressure and continued contact; (5) Vasomotor paresis.

Protections against Infection:—(1) Peritoneal fluid; (2) Plastic powers of the peritoneum; (3) Phagocytosis in the peritoneal cavity; (4) Phagocytosis on the omentum; (5) Phagocytosis in the lymphatic nodes; (6) Phagocytosis and bacteriolysis in the organs. During the first two or three hours the bacilli decrease very rapidly in number; this is due probably, more or less, to the bactericidal action of the body fluids, and as this power becomes exhausted, the slower process of phagocytosis continues the defensive measures.

Etiology.—Hæmatogenous peritonitis is rare; it is met with as a terminal event in some chronic debilitating diseases. Perforative peritonitis may be due to perforation from without, or endogenous when the source of trouble is by far the most often in the alimentary canal, especially the pylorus and vermiform appendix.

The cause of death is the primary overwhelming dose of toxins.

Bacteriology.—The *Staphylococcus pyogenes albus* has a protective function by determining a rush of fluid and leucocytes. It not only promotes local immunity, but it causes sufficient reaction to produce agglutination and adhesions, which tend to limit infection. Its origin is unknown, but it doubtless comes from the intestine. It appears first and disappears last in all abdominal infections of intestinal origin. Most cases of peritonitis are mixed infection. The condition is dangerous directly in proportion to the absorption. It is not the inflammation of the peritoneum which is fatal, but the toxins which are absorbed from its products that cause the severe manifestations, or perhaps death. In peritonitis there is an early acceleration of absorption, but later on there is a slowing; therefore, if a patient can be tided over the early stage, all will be well.

Pathology.—Diffuse septic peritonitis is the pathological variety usually due to the streptococcus. It seems that the organism in its growth in the peritoneum is characterized by (1) a tendency to produce relatively large amounts of toxins and (2) by very little plastic exudate, and (3) by a tendency to penetrate the subserous lymph spaces. The serous element is usually very small. The streptococci readily and rapidly pass through the lymph spaces and vessels into the general circulation; this rarely occurs with other pathogenic organisms.

Symptoms.—In perforative cases the first symptom is sudden, intense paroxysmal pain, localized low down in the abdomen in intestinal perforation, high up or even in the back in gastric perforation. Collapse, rigors, or emesis are not uncommon at the onset. Tenderness and rigidity of the abdomen are marked—at first localized, later generalized. The pulse is rapid and small. The patient is curled up to relax the abdominal muscles, and respiration is of the costal type. The temperature is always elevated at some time in the course, usually early. In the later stages vomiting in small quantities is an important sign. In typhoid fever, when the patient is in the apathetic state, the onset may not be observed unless the pulse and abdomen be closely watched.

Differential Diagnosis.—Peritonitis is diagnosed from intestinal obstruction by the presence of borborygmi and absence of fever in the latter condition. Both acute pancreatitis and thrombosis of the mesenteric vessels are extremely difficult to diagnose from peritonitis.

Prognosis depends upon the variety of micro-organism, the location of the perforation, and the rapidity with which the contents of the viscus escape.

Treatment.—Directly perforation is diagnosed, place the patient in Fowler's posture, and keep there until convalescence is well advanced. The opening of a perforation should never be allowed to remain patent. Murphy advocates drainage, for the relief of pus tension is the first surgical step toward retarding absorption in all acute infections. "The entire technique should be accomplished in a very few minutes, i.e., get in quickly—get out quicker." Directly the patient is returned to bed, proctolysis is instituted and maintained until the serious symptoms of intoxication cease. He never gives opium either before or after operation.

Hans Hoddick[2] was asked by Heidenhain to make a short review of the work done in the treatment of low blood-pressure due to peritonitis with intravenous injections of **Sodium Chloride** and **Adrenalin.** He has followed his directions in this work for the past two years, and has proved the value of his treatment in many cases of grave general peritonitis caused by appendicitis and other conditions. His results have been more than satisfactory. Romberg and Passler have shown that in acute fevers the circulatory disturbances are not due to primary heart affection, but to a paresis of the vessel centres in the medulla. Not only is this true of infectious conditions, but also of peritonitis. In his cases he has only used adrenalin in very severe cases of suppurative peritonitis. In the milder cases it is sufficient to use camphor, caffeine, and normal saline solution injected subcutaneously. Following are the results before and after the use of this substance in general peritonitis from ruptured appendix :—

		Cured.	Died.
1901	.. ..	3	3
1902	.. ..	—	5
1903	.. ..	1	4
1904	.. ..	2	2
1905 } 1906 }	Used adrenalin and normal saline	9	1
		4	2

It is interesting to note the effect of this substance. If the injection is made before the operation, the blood spurts out from the vessels and is quite red in colour, but if operation is done before the injection, the vessels are almost empty, the blood is dark purple colour, and flows without pressure from the vessel. Only in very doubtful cases was the injection made before the operation, and if the pulse improved to a considerable extent the operation was proceeded with.

The technique employed by the author is as follows:—He does not wash out the peritoneum, but tries to get rid of the pus with dry tampons, and the intestines are moved as little as possible from their position. The tampons are of sterilized or iodoform gauze. If after the operation the patient has pinched cheeks, a pulse which can scarcely be felt—small and frequent, the face cyanotic and eyes sunk, and is bathed in cold sweat—all the signs in fact of the deepest circulatory disturbances—he uses adrenalin injection. The result is quite unexpected: the face becomes red, the cheeks rise, and the pulse is slower and has a gradually rising pressure. The injection is made into the vein on the inner side of the elbow joint, and consists of ¾ to 1 litre of normal saline with 6 or 8 drops of adrenalin at 41° C. He takes twenty to thirty minutes to inject it. One injection is almost sufficient to get rid of the collapse, and to maintain the position thus gained by camphor and caffeine. In the more dangerous cases he has used a second injection, but not more: a third will only postpone a fatal result. The adrenalin, he believes, acts directly on the circulatory centre in the medulla. He proposes to publish the whole of his work in this direction through Prof. Heidenhain, but the results obtained are of such clinical importance that he has given in this way his general results.

Otto Rothschild[3] points out how, in spite of our improved methods of operation and the perfection of our treatment, we get every now and then fatal results which from the point of view of the surgeon should have been satisfactory. These results are due usually tocollapse after operation, and it is exceedingly difficult to fight such a complication, so that any new substance which constitutes a new weapon of offence is all the more welcome. Heidenhain, as the result of an experimental research, recommends adrenalin for this purpose, and as the cases in which this substance have been used are comparatively few, it is hoped the one he relates will not be without interest.

Frau S., æt. 40, admitted for perforating appendix. On opening the abdomen, a large quantity of foul pus escaped. The cavity was cleansed as far as possible, a drain inserted, and the wound stitched up. Twelve hours after the operation there was marked collapse, which increased in intensity in spite of large doses of camphor and the subcutaneous injection of 1½ litres of sodium chloride solution. Temperature normal, pulse 130 and irregular. Pulse four hours after still more feeble, 150, but not to be felt at the wrist, respiration very rapid, and vomiting. The prognosis was absolutely bad, and death seemed imminent. As a last resource one litre of normal saline was prepared, to which was added 8 drops of 1–1000

adrenalin solution. In a few minutes after the beginning of the injection the pulse improved, and the general effect was phenomenal. A second injection was given on the following day, after which the patient made an uninterrupted recovery, and no doubt this was due to the adrenalin.

He believes it to be an excellent substance, and one likely to be of great value to help over the first few critical hours after operation.

Kotzenberg[1] says that in recent times appendicitis has greatly increased the importance of diffuse suppurative peritonitis. Formerly this condition was almost uniformly fatal in its results, but now we recognize that timely interference and improved technique are followed by good results. We have more exact methods of dealing with the peritoneum. We recognize that it is not like other cavities in that its capacity for absorption is extraordinary, and it absorbs toxins and antiseptics with the same facility, so that we are unable to deal with it in the same way as an ordinary abscess cavity. Further, we are not able to drain it so effectually as other cavities on account of the fact that we are not able at all times to get to the lowest point. It is true we can drain the pelvis through the rectum or vagina, or by the border of the lumbar muscle, but this is only a small portion of a large cavity. Even this in the case of the rectum is technically difficult on account of the large vessels, and the subsequent treatment is troublesome, so that as a matter of fact we can only satisfactorily drain Douglas' pouch. If an attempt is made to drain the peritoneum through an incision in the middle line, the opening of the drainage tube lies at the top of the incision and not at the deepest part of the cavity, so that if the secretion does not get away, it is necessary to use some form of suction. Not only so, but there is the irritation of the tube tending to cause inflammatory adhesions, and little pouches result. For the drainage of the peritoneal cavity several methods have been used : first, that of indiarubber tubes, the objections to which have been noted ; and there is the tampon of gauze of Mikulicz, which overcomes these objections but again has the disadvantage that it soon becomes blocked with serum, and its removal is difficult. A combination of these methods has been tried, viz., to plug the tube with gauze ; but again the end of the gauze which protruded not infrequently becomes agglutinated with serum, and is rendered useless. Then Hegar's glass tubes were used in this way, and were not so readily blocked. More recently, Dreesman has modified the Hegar tube. His tubes are of different lengths and sizes. One end is funnel-shaped and with holes, which enable it to be secured by threads. The tube has an opening extending its whole length, and at its bottom and sides are openings of not more than 1 mm. diameter. The tube when in use is tightly plugged with gauze.

On the treatment of the peritoneal cavity itself there are many different views. At present most authors favour a thorough rinsing of the abdominal cavity. Another important point is to restore as far as possible the abdominal pressure. For the last twelve months Kotzenberg has followed a definite line of treatment, embodying as

far as possible the principles already laid down and founded on the work of Rehn and Noetzel. In a suspected perforated appendix case he makes an incision along the outer border of the rectus muscle, or across it. On opening the peritoneum he stuffs the upper part of the abdominal cavity, and the side opposite the incision and below, with gauze tampons, to shut off these areas from infection, and also to get easy access to the field of operation. All pus is removed with gauze, and then the appendix is removed, and he rinses the area with NaCl solution 9 per cent at 37° to 39° C. This is removed by compress at once. Finally, there is a rinsing of the whole cavity with the same solution, and lymph shreds are removed by hand. In any case eventration is avoided if possible. Then the drainage tube is introduced, and the pelvis and both hypochondria are rinsed until the fluid comes out quite clear. The wound is stitched in three layers, leaving only a small opening at the lowest point for the drainage tube packed with iodoform gauze. The tube is Dreesman's, 2 or 2½ cm. opening, in children less. This is put into the pelvis.

The after-treatment is of great importance. We put the patient in a reclining position in bed at an angle of 20°. The tampon drain remains in for three or four days, but the gauze is removed several times a day, and is almost painless. Dry gauze is used for the first day, and the second day moist gauze on which is put a layer of dry gauze or wood wool, and the whole secured with a stout bandage. At the end of the third day the large tube is replaced by a smaller one. Often the tube comes out by itself as a result of the healing process. In any case, see that the intestinal functions are maintained. If they do not come on soon, we order on the first day 10 cc. glycerin injected into the rectum; if no result, 4 to 5 mgrams of strychnine every hour for four hours.

In conclusion, the main points for successful results are: (1) Efficient tampon drainage after Dreesman; (2) Restore as far as possible intra-abdominal pressure; this is only done by exact suturing of the abdominal wall in three layers; (3) Efficient rinsing with NaCl solution, all of which is not removed, but comes out by drainage tube; (4) Position of 20° is required in after-treatment, and frequent removal of tampons from the tube.

Temperature in Peritonitis.—Propping[5] says that Madelung was the first to call attention to the difference between the rectal and axillary temperature, and he stated that by this difference it was possible to diagnose the existence of suppurative peritonitis. Much attention was directed to the subject in consequence, but the results of different authors vary very much and are of little value. Much of the difference in results is due to defective methods in taking the axillary temperature, with the result that this is shown to be lower than it really is. As there is thus so much divergence in results, the author undertook a series of experiments on himself, taking care as far as possible to eliminate errors, and he found that in the healthy individual there was some difference between

the axillary and rectal temperatures. His results on the whole corroborate the findings of Lictermeister and Jargensen. These differences depend on whether the body is at rest, or is in exercise, whether it is fully clothed, or exposed to cold air or cold douche, so that in a healthy individual it is possible to have a high or low difference between the axillary and rectal temperatures by simply altering the conditions of the experiments. In his clinique, in cases of suppurative peritonitis, he found some with an abnormally high temperature difference, others in which there was no difference whatever, and he found these conditions could occur in many other states than peritonitis, e.g., pneumonia, empyema, apoplexy, and a dislocated elbow, so that he concludes that the abnormal high temperature difference between axilla and rectum is caused in the healthy and feverish organism by a relatively low axillary temperature. (2) The extent of the difference is inversely proportional to the extent of the heat production in the muscle; (3) There is a considerable difference of these temperatures in all cases of fever, and in about one quarter of the cases of peritonitis when the disease is at its height; (4) An accurate temperature can only be taken in the rectum.

REFERENCES.—[1]*Surg. Gyn. and Obst.* June, 1908; [2]*Centr. f. Chir.* Oct. 12, 1907; [3]*Münch. med. Woch. Mar.* 10, 1908; [4]*Berl. klin. Woch.* Mar. 30, 1908; [5]*Münch. med. Woch.* Mar. 10, 1908.

PERTUSSIS. (*See* WHOOPING-COUGH.)

PHARYNGITIS, CHRONIC.

(*Vol.* 1899, p. 431)—The following gargle may be useful: R Ext. Rhus Glabræ, Ext. Hydrastin Fl., Glycerini, āā ʒj. Potassii Chlorat. ʒiss, Aq. ad ʒvj.

PHARYNX, DISEASES OF.

William Milligan, M.D.
D. Lindley Sewell, M.B.

Chronic Pharyngitis.—In the treatment of chronic pharyngitis P. McBride[1] calls attention to what he terms **Medicinal Exercise.** He recommends the following plan of procedure:—(1) So far as possible exercise all the muscles of the body. (2) During its continuance deep breathing should be practised—inspiration through the nose, and expiration perhaps preferably by the mouth. In this connection it is most important to see that inspiration and expiration are performed at suitable times—for example, inspiration when the arms are raised, expiration as they are brought down. (3) It is desirable not to induce fatigue, but to increase the rapidity of breathing somewhat, and to cause a feeling of general warmth or even perspiration. (4) Straining of any kind must be avoided. (5) The window should be as widely open as possible. Of course it stands to reason that flannels or other light clothing must be worn during the movements, and removed immediately afterwards. A sponge wet with cold or tepid water should then be rubbed over the surface, and friction with a rough towel applied. Probably the best time for such exercise is just before the mid-day or evening meal, when, as a rule, twenty to thirty minutes will suffice.

REFERENCE.—[1]*Brit. Med. Jour.* Sept. 26, 1908.

PHLEBITIS. *John Cowan, D.Sc., M.D.*

Robin[1] confines the affected limb in a posterior splint for from twenty to thirty days after the initial fever has disappeared. If there is much pain he envelops the affected area in compresses soaked in a mixture of equal parts of ext. hyoscyami, ext. opii liq., and tinct. belladonnæ; and, so long as fever persists, injects every other day into the tissues near the vein a solution of the metallic (silver, platinum, palladium) ferments. The limb is kept at rest for six days after removal from the splint, when passive movements are commenced, and the limb is gently rubbed with ext. hamamel. liq. 3 : adip. benzoat. 30. He now recommends 10 min. of a mixture containing equal parts of ext. hamamel. liq. and ext. viburni prunifol. Ten days later the limb is put to the ground and gentle massage and exercise allowed, but the leg should always be elevated when the patient is sitting, and a crêpe bandage should be worn. The following prescription is useful, a dose (4 dr.) being taken just before lunch and dinner :—

R	Sodii Arsen.	gr. $i\frac{3}{4}$	Aq.	ad ℥x
	Potass. Iodid.	gr. lxxx		

Recovery is often hastened by spa treatment.

Reference.—[1]*Med. Press*, April 29, 1908.

PHLYCTENULAR CONJUNCTIVITIS. (*See* Conjunctiva.)

PILES. (*See* Hæmorrhoids.)

PITYRIASIS RUBRA.

(*Vol.* 1900, p. 401)—**Rest in Bed** at a uniform temperature is universally recommended. For local applications, some recommend oily, others watery, solutions. **Liquor Carbonis Detergens** is among the sedatives used. Mackenzie recommends lotion of glycerin of subacetate of lead 1 oz., glycerin 1 oz., water to 1 pint. The patient is to be covered from head to foot with lint soaked in this lotion. Morris thinks opium may be used for insomnia if the kidneys are normal. **Mucilaginous Baths** are soothing.

PLAGUE. *J. W. W. Stephens, M.D.*

C. A. Gill,[1] discussing the epidemiology of plague, points out that it has spread gradually from India to Afghanistan, and he thinks that it will eventually reach Europe through Constantinople. It is necessary to remember that plague has a definite seasonal prevalence, and that imported cases only in the "plague season" give rise to rat mortality and plague in man. The modes by which it spreads are :—

1. *By Pneumonic Cases*—these being strictly confined to the first two months of the epidemic. The frequency of these cases is variable. In the villages investigated by the author pneumonic plague was responsible for the epidemic in 16 per cent. The infection in pneumonic plague is direct from man to man.

2. *By the Agency of Man*—i.e., an infected individual arrives in a village, and a week or ten days later dead rats are found in the house occupied by the individual. The area in which dead rats are found now increases, and soon a plague case occurs in the vicinity of the

house where they were first found. Fifty to a hundred cases eventually occur daily, and the epidemic lasts about a month or six weeks.

3. *By Infected Clothing or Merchandise* conveyed from an infected place by a healthy person. There is evidence that this mode sometimes occurs.

4. *By Migration of Rats.*—The author saw no instance of this in the villages examined by him.

The means of prevention involve: (1) Control and supervision of individuals coming from infected areas: (2) Destruction of rats in the area to be protected. At seaports, ships coming from infected ports directly or indirectly should have their rats destroyed by the Clayton or other method. At night all cables should have "rat-shields" fixed.

J. A. Thompson[2] advocates taking measures, not only against rats, but also against fleas in the exceptional cases where this is possible. For instance, when plague rats have been found in a dwelling about to be cleansed, the first thing to do is to spray the floors freely with 5 per cent carbolic acid solution, which is an effective pulifuge and pulicide.

A. Buchanan[3] adduces figures to show that the presence of **Cats** in villages is a great protection against plague, and concludes that when the number is sufficient all risk of plague is abolished.[4]

H. M. Crake,[5] in an investigation into the relationship between rats and plague, finds in Calcutta that rats breed more or less the whole year round, the average percentage of pregnant females being 25 per cent. October is the month when they breed most freely. The data available were, however, insufficient to connect these facts with the seasonal occurrence of plague.

N. H. Choksy[6] gives data respecting the use of the **Yersin-Roux Antiplague Serum** in treatment. As the mortality of plague is about 90 per cent, great results can hardly be expected; but if the serum is used within the first twenty-four hours the whole course of the disease is altered. The normal duration of the case of eight to ten days is reduced to four or five days, serious complications are averted, and convalescence is rapid. After forty-eight hours the course is not perceptibly modified.

The results of D. T. Verjbitski[7] are given in the form of a translation of his original thesis for the degree of M.D. St. Petersburg, 1904. The work of this author covered much of the ground subsequently taken by the Plague Commission in India. The common rat-flea in Cronstadt was *Typhlopsylla musculi*, a species generally found on mice. The author found that fleas (*T. musculi*) and bugs fed upon infected rats and conveyed infection to healthy rats—the fleas for three days after infection, the bugs for five days. This fact, as far as fleas are concerned, affords a satisfactory explanation of plague epidemics amongst rats, the fleas leaving the dead rats to seek out healthy ones. As regards the occurrence of plague in man, it may be explained by the fact that although *T. musculi* does not bite man, yet some of the fleas of domestic animals may be present on rats, and also occasionally human fleas, which readily bite both men and rats. [It

must be remembered that in India *P. chopis*, by far the commonest rat-flea, bites man also.—J. W. W. S.] The author holds that the linen of plague patients may convey plague by its being soiled with the fæces of fleas containing plague bacilli.

Bannerman and Kapadia[8] find no evidence that the domestic animals of India—pigs, calves, fowls, turkeys, geese, ducks—harbour plague as stated by Simpson to be the case in Hong-kong. It is probable that the disease Simpson observed was some form of "hog-cholera."

The Commission further investigated *the infectivity of excreta* as regards the spread of plague, but found that they were ineffective in this respect. The fæces are rarely infective, the urine rubbed into the scarified skin of guinea-pigs was non-infective, and guinea-pigs exposed to intimate and prolonged contact with linen soiled with the excreta of moribund patients were not infected.

With regard to the mode of dispersal of fleas, this may take place in three ways: (1) By the natural host of the flea, e.g., the rat: a large part of the life of fleas is spent on the ground, so that a rat in its wanderings is constantly picking up and dropping fleas; (2) The host itself may be transported, e.g., rats in merchandise; (3) Fleas may be carried about in merchandise, grain, clothes, etc., though in the absence of a host, fleas usually die in about five days. Larvæ, however, as they feed on rubbish, and pupæ, which do not require food, could be carried for a period of one or two months.

Prevalence of Fleas and Plague Epidemics.—In the areas investigated it was found that there was a distinct seasonal variation in the number of rat-fleas. When plague is epidemic the average number of fleas per rat is above the mean, while during the non-epidemic season it is below the mean.

The Rat Epizootic and Human Epidemic depend upon a suitable mean temperature below 85° F. and generally over 50° F. It was found in connection with this that transmission experiments by fleas do not succeed in a hot room (85–90° F.), while those in a cold room (60° F.) during the non-epidemic months succeed. A temperature of 50° F. affects the rat in that the number that develop septicæmia is very much less than at high temperatures.

A. C. Dixon[9] believes that the usual doses of Yersin's antiplague serum are too low. Unless a rigor is produced as the result of injection he considers the dose has been insufficient. The author uses up to 130 cc. intravenously. He records a "hopeless" case of pneumonic plague cured in this way.

[Dr. Khan Bahadur N. H. Choksy, M.D., in charge of the Maratha Plague Hospital, Bombay, strongly advocates the use of suprarenal gland to arrest heart-failure in plague. He has made a prolonged trial of different preparations, and although the statistics are not sufficiently extensive to enable accurate conclusions to be drawn he has convinced himself that the extract renaglandine (Oppenheimer) was if anything more reliable than other preparations, and also less costly. It was therefore adopted throughout the epidemic of 1908. He administered

5 to 30 min. by the mouth, or subcutaneously 5 to 20 min. In some cases this was administered alternately with a stimulant injection, i.e., sparteine sulphate gr. $\frac{1}{2}$, strychnine gr. $\frac{1}{33}$, and atropine gr. $\frac{1}{200}$.—Ed. *M.A.*]

References.—[1]*Lancet*, Jan. 25, 1908 ; [2]*Ibid.* Oct. 19, 1907 ; [3]*Ind. Med. Gaz.* Oct. 1907 ; [4]*Brit. Med. Jour.* May 30, 1908 ; [5]*Ind. Med. Gaz.* Oct. 1907 ; [6]*Brit. Med. Jour.* May 30, 1908 ; [7]*Jour. Hyg.* May, 1908 ; [8]*Ibid.* ; [9]*Lancet*, No. 4407, in *Arch. f. Schiffs u. Trop. Hyg.* 1908, No. 10.

PLEURAL EFFUSION. *Joseph J. Perkins, M.A., M.B., F.R.C.P.*

Sir James Barr[1] advocates the treatment of these cases by withdrawal of the fluid and the substitution of **Sterile Air** and **Adrenalin Solution.** Previous to the adoption of this method, of which he was the originator, he was chary of interference, holding that the presence of the fluid keeps the collapsed lung at rest, preventing the dissemination of the bacilli in the tuberculous cases which form so large a proportion of all cases of acute effusion. He now prefers to remove the whole effusion, as he obtains the advantages of his older method and at the same time substitutes a light, innocuous fluid for a heavy and deleterious one. In the old, in whom the rigidity of the chest wall tends to hyperæmia and œdema of lung after tapping, the method is of great service. After withdrawing a certain amount of fluid, he stops the siphon before any great negative pressure is established, and introduces a quantity of air about equal to that of the fluid removed. Starting again, he completes the withdrawal, and when all the fluid is removed, injects 4 cc. of adrenalin solution (1–1000) diluted with 8 or 10 cc. of sterile normal saline solution. In some cases more sterile air is introduced, so as to make the total amount equal to a half or three-fourths of the fluid removed. He prefers the siphon to the aspirator, on the ground that the force of suction is more easily regulated and never becomes excessive. The adrenalin lessens the secretion by constricting the vessels. [The appliances for carrying out Sir James Barr's treatment are made by Messrs. Sumner & Co., Liverpool.]

Vaquez[2] follows somewhat the same lines in treatment, but does not inject adrenalin, contenting himself with the introduction of sterilized air or **Nitrogen** only. He has employed his method in seventeen cases, ten of which were tuberculous, two cancerous and hæmorrhagic, while four were purulent, and claims that it is curative for recent sero-fibrinous effusions, and is equally successful in cases of recurrence of fluid. In one of his cases tapping had already been practised twelve times ; at the thirteenth sterilized air was injected, and the fluid did not re-collect for three months. A fourteenth tapping with injection brought about a cure. In another case, where removal had been necessary five times in six months, an injection of nitrogen prevented recurrence. The cancerous cases, which had needed tapping more than once, were equally successful as regards the re-collection of fluid. For pneumococcal effusions he prefers drainage. Of three empyemata treated by nitrogen injection, one only needed operation,

while the other two lived ten and thirteen months respectively without further interference. In the fourth case of empyema the fluid was not completely removed, but re-collection was checked. The action of the gas is purely mechanical; one volume of nitrogen is injected for every two volumes of fluid withdrawn. An inert gas of slow absorption is necessary; nitrogen fulfils the requirement perfectly, as it is not completely absorbed even after eight months.

REFERENCES.—[1]*Lancet*, Nov. 9, 1907; [2]*Sem. Méd.* May 27, 1908.

PNEUMONIA. *Joseph J. Perkins, M.A., M.B., F.R.C.P.*

Gilman Thompson[1] strongly advocates the importance of abundant **Fresh Air** in the treatment of pneumonia. He draws his conclusions from the results of his experience at the Presbyterian Hospital in New York, which received in 1906 128 cases of acute lobar pneumonia drawn from the poorest classes, and among them many alcoholic subjects. It has been his practice to place the patients either outdoors on balconies or the roof, or if indoors, close by windows widely open night and day, though the thermometer might stand at 35° to 40° F. It has been the universal testimony of the nurses that the patients were much quieter, less cyanosed, less restless and delirious, and slept better. With this opinion the patients themselves agreed. Caution must be exercised with the very aged, with feeble infants, and with serious cardiac disease, though even among these benefit accrues. M. H. Fussell[2] agrees in the all-importance of pure air, but adds that fresh air need not necessarily be cold, and allows the sick room to be heated. Both the writers strongly criticise the usual practice, which heats the room, neglects ventilation, and allows the scanty supply of air to be largely drawn on by the presence of unnecessary relatives and attendants.

J. W. Kilmer,[3] writing of his experience among poor children in dispensary practice, urges the same method on the parents, and advises that either the windows should be open day and night, or that the children should be laid out on the fire-escapes of the tenement houses. He insists that the children shall be brought to the hospital every other day or every day, no matter what the weather, and so far from seeing any ill effects, believes that the outing in the fresh air is beneficial.

S. West[4] and others urge the necessity for limiting the **Diet,** and especially the amount of milk given. Two or three pints are ample for an adult; if more is given, as is so often the case, it merely remains in the stomach to lie undigested, ferment, and cause tympanites, a source of discomfort, alimentary upset, and, what is more important, embarrassment of the heart. Plenty of pure water should be allowed, to allay thirst.

As to the need of **Alcohol,** much difference of opinion exists. G. W. Sutherland,[5] discussing the question, concludes that, while not necessary in the early days of the illness, after the fourth day, or when signs of the pre-critical stage present themselves, it may be given with advantage, and continued till after the crisis. The first indication

for its use is failing tension or rapidity of the pulse (110). The first sound at the apex is often found blurred or weakened at the same time. Sleeplessness, a dry mouth and tongue, low, muttering delirium, and restlessness call for alcohol. If the symptoms mentioned pass away under its use, it should be continued; if no improvement follows, it had better be discarded entirely. A full, bounding pulse contra-indicates alcohol, and it is useless in profound toxæmia. Failure of the cardiac centre, and the collapse thus induced, are the call for it. Blocking of the right heart must be relieved previously by bleeding or like measures, the place of alcohol being to strengthen the left ventricle after the pulmonary circulation has been relieved. He prefers sound brandy or whisky to wines, on account of the more uniform percentage of alcohol in them; a mild amount of stimulation will be secured by three ounces in the day, a moderate amount by six, and a full amount by nine. These amounts may seem large, but alcohol is often better tolerated in pneumonia than in health, and the necessary period of stimulation is limited within three to six days. It should be given diluted and at regular intervals in doses of 2 to 4 dr. Sometimes sleeplessness or delirium is best met by a single full dose of 1 to 2 oz.

For the treatment of high fever, West[4] considers cold bathing attended by a good deal of fatigue; he prefers **Cradling,** the cradle extending from the chin to the feet, with only a single sheet laid over it, inside which ice-bags if necessary may be hung. A hot bath (105–108°) is valuable for children to reduce fever and restlessness; a few handfuls of mustard may be added. After removal from the bath the patient, without being dried, is laid between blankets; profuse sweating soon sets in. Such a bath may be given daily in the evening, or even twice daily.

For cardiac failure, **Bleeding** is of great value in cyanosis of robust and florid adults, but must be employed with caution in the weakly. Nitroglycerin (Fussell) greatly enhances the value of digitalis.

The guide to the safe employment of **Morphia** (West[4]) is the amount of secretion in the air-tubes. It should not be used when there are signs of congestion in the non-solid portions of the lung. Otherwise, it may be given, and with great benefit.

P. Kidd[6] strongly supports West in his views as to the value of, and indications for, opium. He prefers **Strychnine** in full doses to digitalis, and strongly advocates the use of **Leeches** for the relief of pain; he has never known them fail.

Arthritis in Pneumonia usually appears as a complication after the crisis (Hector Mackenzie[7]), the larger joints being the most commonly affected—knees, hips and shoulders—but any may be attacked. The joint is hot, swollen, and tender, but redness and œdema are rare; periarticular inflammations also occur. Arthritis is met with at all ages, but many of the recorded cases have been in quite young children. Incision and drainage are the only treatment.

Treatment by Vaccines.—Fifteen cases have been reported by

Boelke (Mackenzie[7]) all of a severe type: thirteen of pneumonia, one of empyema, and one of pneumococcic endocarditis. Eleven of the cases of pneumonia recovered—two after one injection, seven after two injections, and two after three—the average dose being 150 million pneumococci.

In the case of endocarditis, the first injection raised the opsonic index, which was as low as 0·1, to 0·53; five injections in all were given in twenty days; in fifteen days the temperature fell to normal, and the patient made a good recovery.

References.—[1]*Amer. Jour. Med. Sci.* Jan. 1908; [2]*Ther. Gaz.* Mar. 15, 1908; [3]*Jour. Amer. Med. Assoc.* July 25, 1908; [4]*Pract.* Ap. 1908; [5]*Clin. Jour.* Feb. 19, 1908; [6]*Pract.* Ap. 1908; [7]*Clin. Jour.* Jan. 1, 1908.

POLIOMYELITIS, ACUTE ANTERIOR. *Purves Stewart, M.D.*

Clinicians at the present day are practically unanimous in regarding acute anterior poliomyelitis as microbic in origin. Various organisms have been found by different observers in the cerebrospinal fluid withdrawn by lumbar puncture during the first few days of the malady; but, so far, no single organism can be regarded as specific for the disease. Within recent years the occurrence of numerous epidemics of acute anterior poliomyelitis has afforded opportunities for a more complete investigation of the morbid anatomy of the affection, and several interesting points have been added to our knowledge. Thus, for example, Harbitz and Scheel[1] studied the nervous system post mortem in no fewer than nineteen cases collected from the Norwegian epidemics occurring between 1903 and 1906. According to the older views as to the pathology of the disease, it was regarded essentially as an affection of the anterior cornua. The Norwegian observers, however, show conclusively that whilst inflammatory changes, consisting in perivascular infiltration by polynuclear leucocytes, are most intense in the region of the anterior cornua, well-marked changes are invariably present in the meninges as well, consisting in hyperæmia with perivascular lymphocytic infiltration. This is in accordance with the clinical symptoms at the onset of the disease, symptoms consisting of pain, etc., which are suggestive of a meningeal affection. Moreover, well-marked perivascular infiltrations are also found in the brain itself, changes which, as in the cord, are an extension from the meninges, spreading inwards from the Sylvian fissure to the adjacent parts of the brain, especially to the posterior parts of the optic thalami, and sometimes to other parts of the grey matter. The disease, therefore, is essentially conducted along the course of the blood-vessels.

This throws an important light on the symptomatology of the disease, which, as is well known, comes on acutely with fever, sometimes even with convulsions. Then, three or four days later, it is observed that there is flaccid paralysis of muscles, sometimes universal, sometimes limited to one or two limbs, and ultimately clearing up to localized paralysis and atrophy of certain muscle-groups, according to the particular levels at which the anterior cornua have been destroyed.

Another important point which neurologists have begun to realize, and to which Collins[2] and Wickman[3] have especially called attention, is that in certain cases a complete recovery takes place, these being cases where the perivascular infiltration subsides and where the œdema of the grey matter clears up, without destruction of the anterior cornual cells. The clinical course of such a case is indistinguishable at the outset from that of the ordinary type; the child has acute fever, followed by widespread muscular paralysis as usual, this paralysis clearing up gradually until it becomes limited to a special group of muscles, but that muscular group, instead of undergoing atrophy in the ordinary way, steadily improves and ultimately recovers completely. Unfortunately such cases are comparatively rare.

The diagnosis of acute anterior poliomyelitis, except during an epidemic of the disease, is usually difficult, until several days have elapsed. At the onset there are simply the signs of an acute fever, perhaps with convulsions such as may occur in any febrile affection in children. Until definite signs of paralysis appear, we can only suspect anterior poliomyelitis; we cannot diagnose it with confidence: but whenever motor paralysis appears, generally widespread in distribution, there is no longer any difficulty. The prognosis, of course, depends on the extent and intensity of the morbid process in the anterior cornua. The most reliable mode of determining this is by examination of the faradic excitability of the affected muscles, after waiting some ten days or so from the onset, to allow of any degenerative reactions to occur. Broadly speaking, any muscle which still reacts to faradism after ten days, even though still apparently paralyzed, will probably recover. More than this, even a muscle whose faradic excitability is lost, may sometimes recover to a considerable extent under appropriate treatment.

The ultimate disabilities of the disease are due, firstly, to the motor paralysis and, secondly, to the deformities. Much can be done, however, to minimize these by properly applied treatment before the chronic stationary stage is reached. As soon as the fever has subsided (generally within four days) treatment should at once be commenced to improve the nutrition of the muscles. This is best accomplished by regular skilled **Massage** of the paralyzed parts. As Nutt[4] has put it, each paralyzed muscle should be emptied of its blood-supply and its capillaries engorged with fresh blood by skilled deep massage, not mere friction of the surface. **Passive Movements** are also of value. If there is any response to **Faradism** in the muscles, this form of electricity should be employed. The paralyzed limb tends to be cold and blue, and its temperature should be maintained by specially warm clothing to the affected part. Massage and passive movements should be persevered with for many months

Another important point in the treatment of these paralyzed muscles is to see that they are not over-stretched, whether by the effect of gravity or by the over-action of unopposed antagonists. An over-stretched muscle acts at a great disadvantage, and it is not uncommon

to find that a muscle which has apparently seemed paralyzed begins to regain motor power when its over-stretching has been relaxed, e.g., by properly-applied splints.

Prolonged rest in bed is not advisable in recent cases of acute poliomyelitis. Once the fever has subsided, everything should be done to encourage restoration of power by massage, electricity, salt douches, passive movements, etc., and by the judicious employment of apparatus to maintain the affected limb in the best position. Such apparatus should never be heavy; otherwise it may overload an already feeble limb, and may do more harm than good. Keppler[5] has devised a special "pendulum machine" to which the paralyzed limb is attached; by its means rhythmic exercises of graduated strength can be performed by the child setting in motion a counterpoise at the other end of a lever.

REFERENCES.—[1]*Sem. Méd.* Nov. 27, 1907; [2]*Med. Rec.* Nov. 2, 1907; [3]*Zeits. f. klin. Med.* 1907, Nos. 1–4; [4]*N. Y. Med. Jour.* Feb. 29, 1908; [5]*Ibid.* June 29, 1908.

POTT'S DISEASE. (*See* SPINAL CARIES.)

PREGNANCY, DISORDERS OF. (*See also* LABOUR.)

Victor Bonney, M.S., M.D., B.Sc., F.R.C.S.

Eclampsia.—Osterloh,[1] after reviewing the various methods of treating eclampsia, gives the following directions: In threatened convulsions the pregnancy should be interrupted by introducing, after preliminary dilatation of the cervix, a **Hydrostatic Bag** into the uterus. If the fit occurs in labour, with the cervix insufficiently dilated, Bossi's instrument should be used, and delivery hastened. In some few cases the introduction of a hydrostatic bag may be alone sufficient. Besides these measures **Venesection** and repeated injections of physiological **Salt Solution** are indicated, whilst morphia combined with **Scopolamine** is spoken well of, and where cyanosis is present **Oxygen** should be administered.

Renal Decapsulation in eclampsia has been successful in Wiener's[2] hands in two out of three desperate cases; but many failures have been reported from other sources.

Audebert and Fournier[3] have collected forty-four cases treated by **Lumbar Puncture.** This should be combined with the other more recognized measures; but it undoubtedly benefits (according to these authors) the cerebral factor of the fits. It should be done when the coma is profound and the case going down hill, but should not be delayed until too late.

Slemons[4] reports a rare case of eclampsia without convulsions. The patient died in deep coma, and post mortem presented all the typical lesions of the disease. He summarizes all the published cases, seven in number, in whom an autopsy had been held, and refers to others suspected to be examples of this condition, but in which recovery ensued. The only proof of the identity of the disease is afforded by autopsy. Clinically, the cases are very puzzling, and may be mistaken

for other forms of poisoning, cerebral syphilis, or acute yellow atrophy of the liver. The presence of albumin is fairly constant, but has been wanting. Casts too are commonly found. The association of profound toxic symptoms with pregnancy is, however, to be regarded as an indication to terminate labour, so that the want of a certain diagnostic test is chiefly of academic importance.

Mangliagalli[5] speaks highly of the use of **Veratrum Viride,** as tested in one hundred cases. Small and repeated doses are to be preferred, and a constant watch should be kept on the frequency and tension of the pulse. The drug is best administered hypodermically, and in the form of a fluid extract. The object aimed at should be to keep the arterial tension low. Its use is contraindicated where initially the pulse is quick and the tension not materially increased. The author uses a sphygmomanometer, and every time the blood-pressure exceeds 180 mm. it is lowered by the administration of a small dose. Out of ninety-six cases treated sufficiently early to hold out hopes of recovery only six died, a result which certainly justifies the good opinion of the drug held by this author.

A series of very interesting experiments have been performed by Albech and Lohse.[6] They injected the liquor amnii of eclamptic patients into guinea-pigs, and caused the death of the animals, with post-mortem changes in the liver analogous to those found in women dying of this disorder. Filtration of the fluid did not materially diminish its toxic properties. Control experiments with normal liquor amnii showed this to be innocuous. It is thus proved that some toxic substance is present in the liquor in cases of eclampsia, which is not normally contained in it.

Justin McCarthy[7] highly praises the use of **Nitroglycerin,** and quotes a number of cases successfully treated by free administration of this drug by hypodermic injection in increasing doses, even up to 7 min.

Harle[8] reports five cases successfully treated by intramuscular injections of 3 to 4 mgrams of **Hydrate of Amyl.** In all of them the convulsions immediately ceased, and delivery was safely accomplished.

Pfannenstiel[9] lays great stress on the importance of non-operative measures, which he considers are adequate in the slighter forms. In the more severe ones prompt delivery is indicated, either by **Cæsarean** or **Vaginal Hysterotomy.** The former is the easiest in most cases. Renal decapsulation has been overvalued in the treatment of eclampsia; but it may be tried in very bad cases where other measures have failed, and especially when the symptoms persist after the birth of the child.

French,[10] in the Goulstonian Lectures, discusses very fully the pathology and symptoms of eclampsia and pregnancy nephritis. He lays stress on the important fact that two distinct types of case occur, viz., that with marked œdema, and that without œdema. The first of these commonly onsets between the fifth and sixth months of pregnancy, and is not, as a rule, associated with subsequent eclamptic fits. The second type is that in which eclamptic symptoms abruptly develop without renal œdema. This type of the disease commonly begins in

the eighth or ninth month, or just before, during, or after full-term labour. The majority of eclamptics, therefore, do not have œdema, this phenomenon being marked in only 16 per cent of the cases collected by French.

It is also noteworthy that, whereas the first type of the disease is more common in multiparous women, the second type is much more frequently seen in primiparæ. Another point noted by French is the frequent association of twin pregnancy with this disease.

Pyelonephritis of Pregnancy.—French (loc. cit.) refers to this curious condition. Its causation has been generally attributed to partial pressure stenosis of the ureter by the pregnant uterus; but French points out that at this rate it should be common in other pelvic tumours besides pregnancy. There is no evidence that such is the case. The bacteriology is very constant, the *B. coli communis* being almost invariably the infecting organism. This probably finds its way to the kidney by means of the blood-stream. The reason is obscure; but possibly constipation may play some part in it. If diagnosed and treated early the condition tends towards resolution, nor is there much tendency to interruption of pregnancy. The treatment should be on purely medical lines at first: **Rest, Light Diet, Laxatives,** and such drugs as are known to benefit pyuria. The course of the disease is frequently a long one. In one severe case recorded by the author the kidney was cut down upon, and found to contain a number of tiny abscesses: but the patient eventually recovered, without either removal or drainage of the affected organ.

Chronic Nephritis.—The same author remarks that pregnancy arising in a patient already the subject of nephritis has such a deleterious effect on the disease that it is manifestly unwise that such a patient should marry. It is true that exceptionally cases occur in which a woman suffering from chronic Bright's disease bears several children successfully, but such merely prove the exception to the rule.

References.—[1]*Münch. med. Woch.* 1908, No. 11, in *Brit. Jour. Obst. and Gyn.* June, 1908; [2]*Monats. f. Geb. u. Gyn.* Bd. xxvii. in *Ibid.*; [3]*Ann. de Gyn. et d'Obst.* June, 1907; [4]*Johns Hop. Hosp. Bull.* Nov. 1907; [5]*Brit. Med. Jour.* Sept. 19, 1908; [6]*Zeits. f. Geb. u. Gyn.* Bd. lxii. Heft 1, in *Brit. Jour. Obst. and Gyn.* Aug. 1908; [7]*Brit. Med. Jour.* 1908, vol. i. p. 1220; [8]*Münch. med. Woch.* 1908, No. 21, p. 1134; [9]*Ibid.* 1908, No. 36, p. 1903; [10]*Brit. Med. Jour.* May 2, 9, and 16, 1908.

PROSTATE, SURGERY OF. *E. Hurry Fenwick, F.R.C.S.*

The last year witnesses a revolt against unskilled and indiscriminate operation. At the last meeting of the American Urological Association Granville McGowan, of Los Angeles, said of prostatectomy that "the difficulties of the operation have been so minimized, the benefits in so many cases so magnified, and imperfect results so glossed over or concealed by writers of known operative skill, that many who have only a very uncertain idea of the anatomy of the urogenital organs are emboldened to commence operations which they never finish, and the necessity for which is often only problematical. So much bad work of

this nature is being done that this very beneficial operation may easily fall into disrepute." "It is not the method selected, it is the man," says Eastman.[1] The question of the frequency of carcinoma of the prostate is also emphasized in last year's literature. It has been frequently insisted upon in the *Medical Annual* from 1900, p. 425. Hawley[2] mentions Engelbach, Burkhardt, Craison, Harrison, Green, Brooks, Belfield, von Frisch, and many others who have spoken more or less recently of the unappreciated relative frequency of carcinoma of the prostate. Albarran and Halle, in a series of one hundred cases of supposed benign prostatic hypertrophy, found carcinoma in fourteen cases. C. H. Mayo found in 291 cases of prostatic overgrowth twenty-six implications by carcinoma, or almost 9 per cent. Moynihan finds 15 per cent of prostates removed carcinomatous, Fenwick about 14 per cent, but the latter rejects many by detecting hardness in the capsule. There is no doubt that some men of great experience have the acumen necessary to determine quite definitely before operation the character of a prostatic enlargement when the hardness involves the capsule, but the intraglandular malignant change is often only revealed by the microscope after the lobes have been removed.

The general recognition of the increasing frequency of carcinoma of the prostate renders it imperative that early diagnosis and radical operations be made. One operator says there has appeared in his own practice one case of cancer to every four cases of hypertrophy of the prostate. The surgeon who does not systematically submit his extirpated prostates to a competent pathologist for microscopic examination cannot know what he has removed. It is now well known that many so-called hypertrophied prostates, exhibited as such in collections, have been found to be cancerous. The lymph-glands may not be involved, and there may be no distinguishing symptoms. All but two of the fatal cases were cancerous, from which it will be seen that Mayo's record is best of all, unless, perhaps, others like himself have included all cases as they met them, cancerous or not, as prostatectomies. We can learn nothing from statistics as to the comparative value of methods unless all the facts are clear. The comparatively inexperienced are misled by ambiguous reports.

A series of one hundred cases of prostatic enlargement without a single case of carcinoma would represent a remarkable series indeed. Therefore, not to expect some failures in such a series is folly. No one will wish to refute this statement. Yet there are those who inadvertently leave the impression that, with the best present knowledge and skill, a series of 100 consecutive successful prostatectomies may be attained. Is it not fair to say that the most trusted authorities often carelessly fail to make clear that their lists of successful prostatectomies do not concern carcinoma? The patients with carcinoma die more or less promptly, and it is fair to assume that success means permanent relief.

Two very important points are also urged this year—the question of a preliminary cystotomy, and the occurrence of incontinence and fistulæ after an unskilled *perineal* prostatectomy.

Ought a preliminary cystotomy to be carried out? The ease and rapidity with which the prostate can be enucleated by either the suprapubic or perineal method has been a strong temptation to its total removal at one sitting. Chetwood, Cabot, and others agree that there are some cases that could be more successfully handled if dealt with in two stages. In extremely old and feeble patients, or where the bladder condition is unsatisfactory, a preliminary cystotomy, followed in ten days or two weeks by enucleation, will be attended with more successful results than if dealt with by one move, as Cabot[3] very tersely suggests. The operation in two stages in acute prostatic retentions has been the rule in Fenwick's wards for some years.

With regard to prostatectomy in two stages, Cabot draws the following conclusions: (1) In the event of any question of the patient's physical condition being equal to a complete prostatectomy, do a preliminary suprapubic cystotomy under local anæsthesia. This will probably be the operation of choice in 50 per cent of the cases. Drain the bladder while the patient is up and about, till the condition is better than before cystotomy. This will take from ten days to four weeks. (2) In all cases with severe cystitis, damaged kidneys in cases suffering with severe hæmorrhages, in all so-called emergency prostatectomies, and in diabetics, carry out the preliminary cystotomy, and later, as the patient's condition warrants it, do an enucleation. (3) Its advantages are the quick relief afforded, with slight shock from severe symptoms. The patient receives all the advantages of a prostatectomy, with none of the serious dangers. He gets good bladder drainage, and consequent rest and comfort. (4) If the preliminary cystotomy kills, a prostatectomy would have been foolhardy. If the patient recovers from the little blow he usually rapidly gains strength: the prostate becomes less congested, the cystitis disappears, and a change has been produced which usually permits a successful enucleation later. (5) At the time of the second operation, well-developed granulation tissue has appeared and prevents absorption. (6) At each operation there will be only one point of hæmorrhage to look for instead of two, as is the case in a complete operation at one time. This is of importance in feeble old men, and should not be overlooked. (7) The final operation should never be performed till the patient's condition is better than it was before the preliminary cystotomy. (8) The ease with which these feeble old men become bedridden is a danger, and therefore the fact that they can be got up so quickly after the preliminary and final operations adds much to their chances of recovery. Their proneness to contract pneumonia and other diseases while lying in bed is well known, and we diminish this danger by getting them on their feet in a few days. This is a much more difficult matter in the severe shock following a one-stage operation.

Dribbling of Urine After Perineal Prostatectomies.—Eastman says: "I believe that when the truth is known of the results of the average genito-urinary surgeon, it will appear that dribbling after perineal

prostatectomy, varying from slight transitory dribbling to complete incompetence, presents itself in a considerable percentage of cases. Leakage due to the leaving of lobules at the urethral orifice and to injury of the sphincters has appeared repeatedly in my commonplace record. I trust that by approaching the prostate back of the bulb and triangular ligament I may do less damage in the future. However, like McGowan, the bad results which I have seen have not always been attributable to my own experience. At least a score of men wearing urinals after prostatectomy done by the most distinguished and most skilful of operators have drifted back to me. If it befits the experience of one man to say that enuresis after prostatectomy is a bugaboo and myth, it cannot be applied to the experience of many. The man with the urinal stalks about, a very present admonition for more careful treatment of the sphincters, and more precise and thorough removal of nodules about them."

S. Alexander, of New York,[4] says: "During recent years the popularity of prostatectomy in the treatment of obstructive prostatic disease, and the prevailing belief that any surgeon, no matter how limited his experience or knowledge, may perform these operations, has multiplied these cases manifold. I say this advisedly, because during the past three years more cases of this kind have been admitted into the service under my charge at Bellevue Hospital than heretofore. These patients were operated upon in other hospitals, and as a result of the manner in which the operations were performed, their condition was made worse, and ultimately they were transferred to Bellevue Hospital. Many of them, according to popular standards, could be classed only among the hopelessly incurable. In some of these cases the obstructing portion of the prostate had been only partially removed, and sufficient obstruction remained to require a second operation for its removal. In other cases the anterior wall of the rectum had been torn, and there were at the time of their admission to the hospital large urethro-rectal fistulæ. The perineum in these latter cases was little more than scar tissue, owing to ineffectual attempts to repair the damage. In most of these cases there was a more or less constant leakage of urine, either into the rectum or through the perineal fistulæ which remained open, or through both. In other cases, although the prostate had been removed, so much damage had been done to the urogenital sphincter that there was more or less dribbling of urine through the urethra. As most of these patients were advanced in years, weakened physically by disease and by a prolonged convalescence after serious surgical operations, the prospect of any amelioration of their symptoms seemed remote."

Loss of Bladder Reflex.—Muren[5] makes a remark the reviewer can heartily endorse: "A number of cases have been referred to me," he says, "for some trouble of the bladder or prostate, the necessity for the removal of the gland being frequently suggested by the physician referring the case. Upon investigation the supposed obstruction is not found, the patient, frequently a man in middle life, having an

enormous amount of residual urine, due to the loss of the bladder reflex from beginning locomotor ataxia. As the bladder reflex is frequently the first one to be lost in this disease, we should be constantly on our guard against surgical meddling with these cases."

The Choice of Method of Operation.—August Schachner[6] remarks that the most urgent question in connection with this subject of operative interference is the choice between the suprapubic and the perineal method. While the most ardent devotee usually concedes that there is a place for the opposite method to the one he espouses, there is frequently hardly enough of this concession. It would be better if there existed a greater desire to see the good in the other side rather than be blindly absorbed in the advantages of the method elected. However attractive the arguments in favour of one method as opposed to the other may be, the verdict in the end must be determined by the mortality. The surgeon who ignores this at once assumes the burden of proving that mortality in surgery is but of secondary importance, and of demonstrating why the so-called best operation which he espouses has a higher mortality than the operation which he denounces as not so good. Statistics can be arranged from many angles, but when we arrange the results of the best operators of the different methods we believe that such statistics represent a fair presentation of the case, especially when the different statistics of the different investigators are practically harmonious. The following collection of cases is illustrative of suprapubic mortality :—

	Cases	Per Cent Mortality
Proust	224	12·0
Watson	263	13·3
Escart	164	18·0
Terney and Chase	396	9·8
Freyer	205	7·3

Following is a list of the most recently reported cases of the perineal dissecting operations with their accompanying mortalities :—

	Cases	Per Cent Mortality
Young	150	4·6
Ferguson	103	3·6
Albarran	73	4·0
Hartmann	56	9·0
Pauchet	53	7·0
Legneu	45	8·8
Murphy	51	3·9
Rafin	32	6·2
Total number of cases ..	563	
Average mortality ..		5·5

In view of the increasing favour with which the dissecting operation of removing the prostate perineally is regarded, we add a description of Young's method. It must be remembered that the perineal dissection operation is not adapted to the *inexperienced surgeon.* If an inexperienced man must risk the comfort and even life of a patient by interfer-

ing with the prostate, let him do so suprapubically, and follow the lines laid down by such experts as Freyer or MacGill. Although the reviewer, who has operated on the enlarged prostate by every known method, is convinced that the suprapubic is the best possible for large prostates (and the inexperienced surgeon had better leave small hard prostates alone if he value his reputation), yet it is only fair to give prominence to the recent work by Young upon perineal prostatectomy, which has been closely followed by all nations but the British.

The points in favour of Mr. Young's perineal prostatectomy operation upon which he lays stress are as follows :—

1. The operator, instead of being unable to see exactly what he is doing suprapubically, and being guided only by his erudite finger, can watch every step of the perineal operation, and see precisely what to remove and what to leave behind.

2. The exposure afforded by the perineal operation is so good, and the tractor gives such an easy means of drawing down even considerable intravesical projections, that it is possible to be quite sure of the complete removal of all obstruction.

3. Non-obstructive structures of certain physiological value, notably the vesiculæ seminales and the ejaculatory ducts, can be preserved, because they can be seen and their removal avoided.

4. Sexual power is therefore not only not lost after the operation, but it is sometimes restored by it.

5. The perineal incision affords dependent drainage in marked contrast to the suprapubic method.

6. The wound is entirely extra-vesical ; the urethra is not damaged.

7. The wound can be packed easily, and hæmorrhage can be very readily controlled, whereas the control of hæmorrhage is by no means easy in the suprapubic operation.

8. All packs and drainage tubes can be removed very early, usually on the day after the operation.

9. No subsequent manipulations, by means of sounds or catheters, are required.

10. It is easy to remove some malignant prostates completely by the perineal route, whereas it is not so easy to be sure that every part of a malignant prostate has been removed by the suprapubic method. More prostates are malignant than used to be believed ; for a long time they do not infiltrate beyond the capsule of the gland, and it is most important to have visual evidence that no part of a malignant prostate is left behind. Mr. Young has several patients who have lived for some years after removal of a cancerous prostate by the perineal route. It is not possible to say beforehand, especially in those cases which are caught as early as they should be, whether the prostate is malignant or merely enlarged, so that the possibility of the existence of malignant disease is a good argument in favour of the perineal method when prostatectomy has been decided.

11. Last, but very far from least, comes the fact that patients after the operation of perineal prostatectomy can be got out of bed on to a

couch in a day or two after the operation, owing to the position of the wound; such early moving of the patient is a most important point, because it has more than anything else to do with the prevention of pneumonia and of uræmia.

The *Johns Hopkins Hospital Reports* contain an account of the operation in 185 consecutive cases, some of the patients being nearly ninety years of age, and amongst all this number of unselected cases, only seven died; since then there have been ninety-one more patients operated on for prostatectomy by the perineal method, without a single death.

Technique of the Operation.—The exaggerated dorsal lithotomy position is the most satisfactory. The perineum should be so elevated that it is almost parallel with the floor. An inverted V-shaped incision is the best. The apex is taken just over the posterior part of the bulb, and the two branches are each two inches long, the posterior limits being about midway between the anus and the ischial tuberosities (*Fig.* 87). This incision is carried through the skin, fat, and superficial fascia. The handle of the scalpel is then used on each side of the central tendon to open up the space behind the bulb and in front of the levator ani muscles. This blunt dissection should be carried well down behind the triangular ligament on each side, before any muscular structures are cut. It is easily accomplished, and a good exposure simplifies the next step in the operation. After exposure of the central tendon by blunt dissection, a bifid retractor is inserted, and traction upon it gives an excellent exposure of the narrow band of central muscle, and greatly facilitates its division close to the bulb. Great care should be taken not to puncture the bulb—an accident which leads to inconvenient hæmorrhage. After the central tendon has been completely divided, a retractor may be placed beneath the bulb, thus affording a better view of the retro-urethralis muscle, which lies beneath the two branches of the levator ani, and covers the membranous urethra and the apex of the prostate in the median line. Special retractors have been devised for making the different stages of the operation easier than might be the case with ordinary instruments.

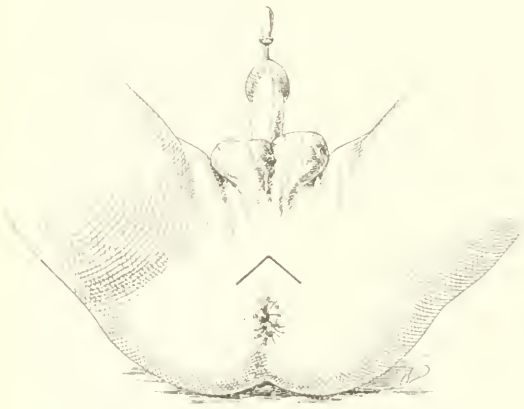

Fig. 87.—The inverted V cutaneous incision.

At this stage it is generally best to remove the bifid retractor and to insert a narrow-bladed retractor about two inches in depth, by which

the rectum can be pushed back and the muscular fibres surrounding the membranous urethra—the recto-urethralis—put under tension. They are then divided by a transverse incision close up to the triangular ligament, and the membranous urethra exposed by blunt dissection.

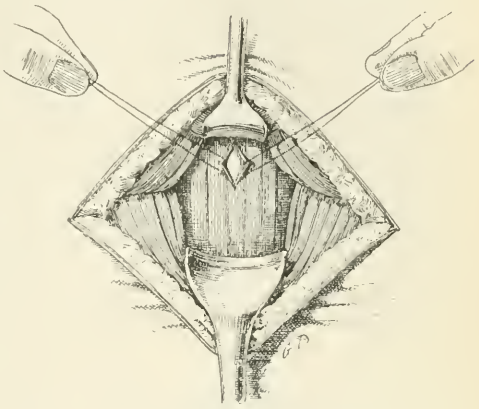

Fig. 88.—Opening of deep urethra and traction threads.

After the membranous urethra has thus been exposed, a retractor is inserted and the apex of the prostate brought into view (*Fig.* 88). The membranous urethra is then opened on the sound which was inserted into the urethra before the patient was put in the lithotomy position, and the edges of the urethral orifice caught up by silk sutures or by Halsted clamps. The sound is withdrawn: a sound of moderate size is then passed through the incision into the prostatic urethra bladder, and the sphincter dilated by a to-and-fro movement of the instrument. The prostatic tractor, closed, is then passed into the bladder, the edges of the urethral wound being held open by the silk sutures or clamps to facilitate its introduction. Carelessness in this part of the operation may lead to considerable trouble. As soon as the beak is free in the vesical cavity, the thumbscrew which fixes the blades in position is loosened, the blades being rotated 180 degrees by means of the external blades, and then fixed by tightening the thumb-screw again. The instrument is now ready for whatever traction may be necessary to draw the prostate well down into the perineal wound.

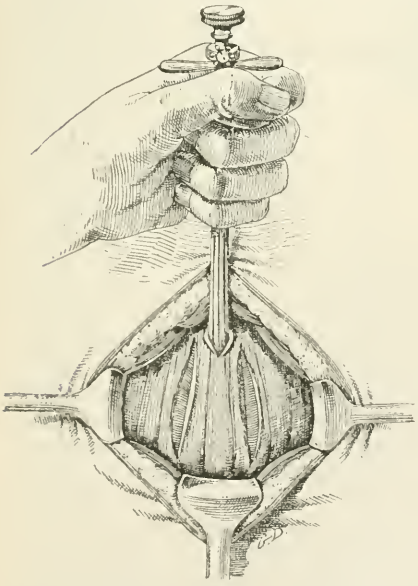

Fig. 89.—Tractor introduced, blades separated, traction made, exposing posterior surface of prostate. Incisions in capsule on each side of ejaculatory ducts.

Lateral retractors are so placed that, with the posterior retractor drawing the rectum backward and the prostatic tractor drawing the gland outward, a splendid exposure of the entire posterior surface of

the prostate is obtained. An incision is then made on each side of the median line for almost the entire length of the posterior surface of the prostate, and about three-fifths of an inch deep. The two lines are divergent, as shown in *Fig.* 89, being about three-quarters of an inch apart behind, and three-fifths of an inch apart in front.

The bridge of tissue which lies between them contains the ejaculatory duct, and its preservation is of importance if the integrity of these non-obstructive structures is to be left uninjured. It is for this purpose that the initial capsular incisions are three-fifths of an inch deep on each side, as these define at once, and correctly, the width of the "ejaculatory bridge," and prevent its being torn, as might happen if blunt dissection were depended on. These incisions bring one at once to the side of the urethra, where the separation of the urethra from the inner surface of the prostate can be easily accomplished later on.

External and Internal Enucleation.—Everything is now in readiness for the external enucleation—that is to say, the separation of the capsule from the lateral lobes by the blunt dissector. It is important to start the separation in the right layer, not so deeply as to lead into the substance of the lobe, and not so superficially as to be outside of most of the capsule. The stripping-up process is continued by blunt dissectors.

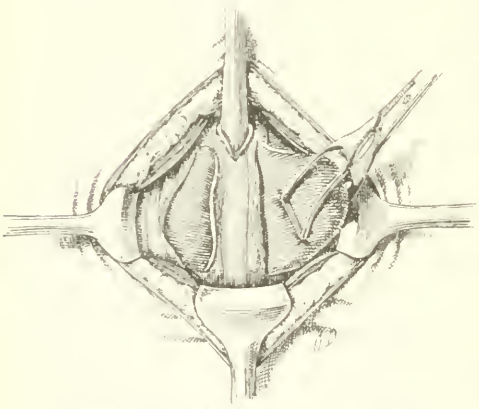

Fig. 9[illegible]—Enucleation of lobes. Forceps in position.

The internal enucleation, —that is to say, the separation of the prostate from the urethra—should be taken up after the external, as it is a much more delicate procedure, and often requires considerable care to prevent tearing into the urethra. As remarked above, the primary incision is made with the scalpel until past the level of the urethra, after which the blunt dissector is used. During this procedure the shaft of the prostatic tractor is firmly grasped in the operator's left hand; it serves not only to draw the prostate so well down into the cutaneous wound that every procedure is done in plain view, but also to steady the prostate and to mark out the course of the urethra so that it can be avoided. At the apex of each lateral lobe, firm adhesions to the capsule, usually requiring division with scissors, are nearly always present.

When the enucleation of a lateral lobe has progressed fairly well on each side, it is advantageous to have traction made on the lobe itself. For this purpose Mr. Young has devised special fenestrated forceps. The two blades grasp the prostate with broad surfaces, so shaped as to hold, but not to cut, the lobe when pressure is applied (*Fig.* 90).

The lobes usually come out in one piece, and it is possible to apply considerable traction without tearing them, thus greatly facilitating the deeper enucleation. Much of this proceeding is done with the blunt dissector, but when the intravesical portion of the lateral lobe is reached, the finger may often be used so as to avoid tearing through the thin mucous membrane covering it.

The intravesical blade of the prostatic tractor, which can be distinctly palpated through the mucous membrane by the enucleating finger, serves to direct the separation of the deeper portion, and warns against tearing into the bladder ; it also shows when some of the lobe has been left behind. The condition present after the enucleation of the two lateral lobes leaves the empty capsule on each side, and the bridge of tissue surrounding the ejaculatory ducts and the urethra intact in the centre.

Removal of Median Lobe.—After the lateral lobes have been shelled out, attention should be directed to the median portion of the prostate. There is often a more or less extensive hypertrophy of the prespermatic group of glands, and the mass can be easily seen, or felt by the finger, in one of the intracapsular cavities. Further examination will generally reveal a fair amount of tissue between the median lobe and the ejaculatory ducts. The median enlargement is generally attached to one or both of the lateral lobes, so that there is no difficulty in shelling it out through one of the lateral cavities, without disturbing the integrity of the ejaculatory ducts (*Fig.* 91). The prostatic tractor may be used with great advantage in removing a median lobe, and the technique for drawing it down into one of the lateral cavities, where it can be enucleated, is as follows : Push the tractor backwards until free in the bladder cavity, depress the handle of the instrument so that the shaft can lie on the middle lobe, and then rotate the instrument 90° so that one of the blades projects downward behind it. Outward traction should then engage the lobe, and it can be drawn down so as to come into sight. To get it into one lateral intracapsular cavity, say the left, two manœuvres are of help : pushing against it with the index finger of the left hand, which has been inserted into the right intracapsular cavity, as seen in *Fig.* 91, and rotation of the blade engaging

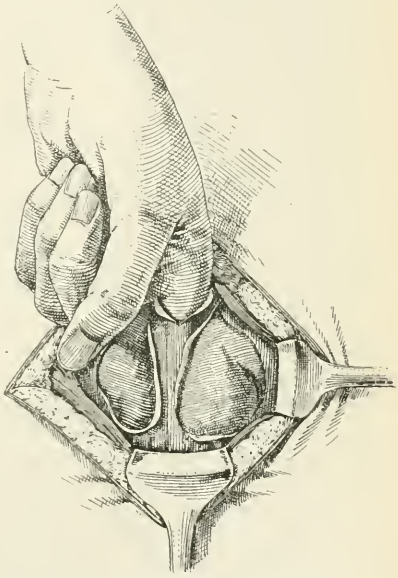

Fig. 91.—Showing use of finger instead of tractor to draw down small median lobe into lateral cavity.

the middle lobe in the same direction, traction being made on it all the while. When the median lobe presents in the left intracapsular cavity, the operator turns the tractor over to an assistant, who continues the traction, while he grasps the lobe with the forceps described above, and then rapidly enucleates it. Often the median mass is directly continuous with the left lateral lobe, and can be removed with it. The condition present after the enucleation of a median lobe shows that the median cavity communicates with the lateral cavities on each side, beneath the intact urethra, whilst the seminal ducts are separated off by the posterior capsule. Before withdrawing the tractor a careful examination should be made by inserting the finger into both of the lateral cavities and palpating the blades through the vesical mucosa, in order to determine that no important glandular mass has been left behind. The tractor is then removed by first rotating the blades until they come together, and then withdrawing the instrument.

Provision for Drainage.—Abundant vesical drainage should be provided, as a small tube may easily become plugged by blood-clots, and thus prove useless. Two catheters of fairly good size are fastened together by ligatures before the operation, so that as soon as the tractor is withdrawn they can be inserted through the perineal wound into the urethra and bladder. In order to facilitate their introduction it is best to cut obliquely across the end of each catheter, and then fasten the cut surfaces together with a single suture, thus making a common point for the two catheters. One catheter is immediately connected with a tank of normal salt solution at body heat, and the bladder thoroughly washed clean of blood. After the tubes have been properly adjusted, they are tied by a heavy silk suture to the skin at the upper angle of the wound. The lateral prostatic cavities are then each firmly packed with a small strip of gauze, but care is taken that the packing is confined to the lateral cavities of the prostate, and especially that none may be allowed to press against the rectum. Before closing the cutaneous wound one should always examine the rectum. With a gloved finger inserted through the anus, and another in the wound, the rectal wall should be carefully examined. Above the anal sphincter it is usually thin, even when uninjured. When it has been very adherent to the prostate the muscular tunic may be torn, and it should be drawn together with a suture or two of fine catgut. The levator ani muscles should next be drawn together to their normal position in front of the rectum. This can be accomplished with a single suture of strong catgut. It is remarkable what a difference the one suture will make. If the inverted V-incision has been employed, the two branches of the wound are closed except in front, where a small area is left open for the gauze and tube drains.

After-treatment.—Irrigation is continued after the patient has returned to bed. A two-gallon porcelain tank with an outlet at the side is employed, and the flow is regulated by a clamp on the inlet tube. The outlet tube drains into a jar by the side of the bed. If the end is

kept immersed in water, air cannot get up the tube, and siphonage is obtained, thus keeping the bladder empty and preventing leakage around the perineal tubes. A submammary infusion of 1½ pints of salt solution is given, either on the operating-table or after the return to bed. This is considered so valuable, both as a preventive to shock and anuria, and as a cure for post-operative thirst, that it is never omitted. The gauze drains are removed on the day after the operation, and no more packing put in. The tubes are pulled out a few hours later, and on the second day the patient is usually placed in a wheel-chair, and taken out of doors. No sounds are passed, and stricture never results. Urotropin is administered early, and water is given in abundance. Within a few days the patient is generally walking about the hospital. Nothing is done to the wound except to keep it clean, and occasionally to cauterize exuberant granulations. The subsequent convalescence has in the great majority of cases been remarkable, simple, and rapid. Out of 105 cases operated on during 1904 to 1906, only nine had persistence of the fistula for more than two months. Fifty per cent of the cases did not remain in hospital longer than twenty-two days. In the great majority of cases urine passed through the penis during the first week, and inside of two weeks there was only a slight escape of urine through the perineal fistula.

REFERENCES.—[1]*N. Y. Med. Jour.* Aug. 8, 1908 ; [2]*Ann. Surg.* 1904 ; [3]*Bost. Med. and Surg. Jour.* Oct. 24, 1907 ; [4]*Ann. Surg.* Aug. 1908 ; [5]*N. Y. Med. Jour.* Aug. 1908 ; [6]*Ibid.*

PRURITUS. (*See* ITCHING.)

PRURITUS VULVÆ.

(*Vol.* 1903, p. 566)—Sieburg recommends the following ointment, to be used as an antipruritic when necessary : Cocaine 2·0. Orthoform 1·5, Menthol 0·5, Carbolic Acid 1·0, Vaseline 20·0. Pregnancy, irritating vaginal discharges, and glycosuria should always be remembered as possible causes.

PSORIASIS. *E. Graham Little, M.D., F.R.C.P.*

Chrysarobin remains the most efficient local application for psoriasis, and should always be used when the attack is not too inflammatory and the patient can give himself up to treatment. Norman Walker[1] has some useful observations on its use in combination with other frequently combined remedies. Salicylic acid may be absorbed when the ointment is used, as it should be, continuously ; the combination of alkali with chrysarobin seems to hinder its action, as also does the addition of organic acids ; this writer has come to the conclusion that simple ointments of chrysarobin with vaseline, half a drachm to the ounce, are the most efficacious, and vaseline he finds the best excipient. This treatment may, in robust persons, be preceded by an **Alkaline Bath** ; but all the alkali must be removed before the chrysarobin is used. The great point of this treatment is the universal application of the 7 per cent ointment, this being rubbed vigorously all over the surface of the body, and not merely on the lesions, from the neck downwards, the face being protected by a linen mask. The application must be

pushed until general erythema is produced ; it will be found that the areas most resistant to this production are the psoriasis patches ; these must be re-treated, and if necessary the drug increased ; and now other ingredients may be added, e.g. :—

R	Chrysarobini			Saponis Viridis	
	Ol. Rusci	āā 20		Vaselini	āā 25
	Acid. Salicyl.	10			

When the erythema appears on the affected areas the treatment may be stopped. This will usually be the case within fourteen days, and the patient should all this time be kept in bed, soaked in his dressings. Then only is he allowed to take one or two warm baths, and he should be thereafter free of the disease. The scalp, however, does not ordinarily allow of this treatment, and it should be shaved if possible, and the following dressing carefully applied, the head being bandaged after :—

R	Chrysarobin	℥j	Chloroform Meth.	
	Glycerin	āā ℥ss		

Saalfield[2] finds the following combination useful :—

R	Acid. Salicyl.		Saponis Viridis	
	Chrysarobin	āā 10	Vaselin. Flav.	āā 25

For the chrysarobin in the above prescription may be substituted :—

R	Liq. Carb. Deterg.		Empyroformi	āā 20

This ointment must be used once a day.

Whitfield[3] recommends in the irritable cases where chrysarobin is inadmissible, an ointment containing 3 per cent **Calomel**, which he has found more useful than the sedative lotion usually prescribed. When patches are resistant to other forms of treatment, **X Rays** are often of signal benefit, and should be given in maximum measured doses once a fortnight. This author finds **Arsenic** of great efficiency in certain cases, and prefers it to atoxyl.

Berendt[1] recommends the use of **Eugallol** paint, either pure or diluted with acetone ; this is allowed to dry on the diseased areas, and then is covered with zinc paste or zinc powder.

References.—[1]*Scot. Med. and Surg. Jour.* Ap. 1908 ; [2]*Ther. Monats.* Jan. 1908, in *Münch. med. Woch.* Mar. 10, 1908 ; [3]*Med. Press*, Jan. 8, 1908 ; [4]*Ther. Monats.* quoted by *Berl. klin. Woch.* Ap. 13, 1908.

PTOSIS. (*See* Eyelids, Diseases of.)

PUERPERAL STATE, DISORDERS OF.

Victor Bonney, M.S., M.D., B.Sc., F.R.C.S.

Puerperal Sepsis.—Knyvett Gordon[1] says that the cardinal points in the prevention of puerperal fever are : (1) The avoidance of anything retained within the uterus ; (2) The careful and proper use of forceps when artificial aid is necessary ; (3) The wearing of indiarubber gloves by the attendant, and a minimal use of vaginal examination ; (4) Douching the vagina he considers risky and unnecessary ; (5) The vulva should be kept covered with an antiseptic pad. He is against

the use of the intra-uterine douche as being ineffective in producing sterilization of the cavity, and liable to set up increased mischief. After a trial of the older and more conservative methods for some years, he has abandoned them in favour of active treatment by the **Sharp Curette** and the application of undiluted **Izal.** His method is as follows: A general anæsthetic is not administered, but one hour previous to the operation 2 oz. of brandy disguised with extract of liquorice and mixed with hot water is given, and half an hour later $\frac{1}{4}$ gr. of morphia is administered hypodermically. The vagina is cleansed and packed with a swab soaked in 5 per cent cocaine solution. When the patient is somnolent she is placed in the lithotomy position, and after cultures have been taken from the uterus by a sterile swab the cavity is digitally explored. The endometrium is then removed completely down to the muscle by a sharp curette, and the raw surface is very thoroughly swabbed over with pure izal and subsequently packed with izal gauze for twenty-four hours. No douching is carried out, but if the discharge again becomes foul, the proceeding is repeated. The result of this treatment has been to reduce the mortality at the Monsall Fever Hospital from 46 per cent to 24 per cent. The cases treated by him in this way have been of the worst type, but he sees no reason why the method should not be equally or more successful in the early and mild ones. He advises that when a rise of temperature occurs in the puerperium which is manifestly due to sepsis, the uterine cavity should be immediately swabbed out with izal, and that if this is not effectual the full technique should at once be resorted to. In cases of general peritonitis due to the same cause this author reports thirteen patients treated by laparatomy and drainage, with eight recoveries, an unusually good result in a condition generally regarded as hopeless. He reserves the use of **Anti-streptococcic Serum** for those cases which are manifestly septicæmic.

Victor Bonney,[2] writing on the treatment of puerperal fever, also condemns the intra-uterine douche as being useless or actually harmful, and in many cases as causing the fatal postponement of more radical measures. In regard to the use of the vaginal douche, he cannot, however, entirely agree with the before-quoted authority. Where the carrying out of this proceeding is in the hands of an ignorant and incapable nurse it should certainly be avoided, but where it can be efficiently performed it is of undoubted value, particularly in those cases where previous vaginal manipulation has been indulged in or where vaginal or cervical lacerations exist. It prevents the retention of lochia and clot in the vagina and washes away and sterilizes septic exudation from the lacerated cervix or vagina. It is certain that vaginal and perineal lacerations invariably become more or less infected, even with the greatest care and with the most painstaking suture. Many of these lacerations are of the nature of "grazes," and are incapable of being sutured. In the paper mentioned, great stress is laid on the conduct of operative labour with the same precautions as are universally admitted to be necessary for the success

of any other modern surgical operation. The use of gloves is a *sine qua non*. Interference, when it is undertaken, must be complete and thorough. An anæsthetist is required, and the anæsthetic should be maintained until the labour is completed. The third stage is to be conducted in dorsal decubitus either on a bed-bath or with the lithotomy crutch in position. The placenta may be expressed or removed manually. In either case the uterus should be subsequently cleared by the gloved hand of all blood-clot, and then irrigated with a large quantity of hot antiseptic solution. From 15 to 20 min. of ergotin should be hypodermically administered. The perineum must be carefully examined and accurately sewn up. A final vaginal irrigation is then made, and the patient allowed to come round from the anæsthetic. The uterus should be held and gently kneaded for an hour after the delivery of the placenta. By these means a firm retraction of the absolutely empty uterus is assured. This is the surest prophylactic against subsequent infection. The lochial discharge is reduced to a minimum by these means. If the labour cannot be conducted on such surgical lines, it is far better to leave it absolutely to nature. It is the cases which have been subjected to a certain amount of non-surgical interference which commonly go septic.

F. Taylor[3] has epitomized the various means of operatively treating puerperal sepsis. His paper is too long to quote in detail, but is an admirable epitome of the subject and should be read by all interested in it.

Warden[4] reports a case in which drainage of the uterus by means of a glass tube was followed by rapid recovery.

The results of **Serum Therapy** in a number of cases have been reported by Müller.[5] A polyvalent serum was employed in all. The outcome of his paper is that whilst this treatment is no specific in many cases, yet in others it has a markedly favourable effect on the course of the disease. On the other hand, Langemeister[6] concludes from personal researches that antistreptococcic sera prepared from horses are without effect on apes, and therefore are probably so on man, and he suggests that such sera should be tested on these animals preparatory to their use on man. In apes, according to him, the injection of such sera may be actually harmful.

Carruthers[7] praises applications of **Hydrogen Peroxide** to the uterus after thorough curettage, instead of izal as recommended by Knyvett Gordon, whilst Bonnaire and Jeannin[8] have published their experience in the treatment of puerperal fever by **Collargol.** To obtain the full action of this drug, it is necessary to administer it by intravenous injection (10 to 15 cc. of a 1 per cent solution) every forty-eight hours. The injection is frequently followed by a brisk rise of temperature, which, however, is temporary.

REFERENCES.—[1]*Brit. Med. Jour.* Ap. 1908; [2]*Clin. Jour.* Sept. 1908; [3]*Pract.* Aug. 1908; [4]*Lancet*, Nov. 16, 1907; [5]*Münch. med. Woch.* 1908, No. 13, in *Brit. Jour. Obst. and Gyn.* May, 1908; [6]*Ibid.* 1908, No. 16, in *Ibid.* July, 1908; [7]*Brit. Med. Jour.* June 6, 1908; [8]*l'Obstétrique*, Ap. 1908, in *Brit. Jour. Obst. and Gyn.* June, 1908.

PURPURA. *E. Graham Little, M.D., F.R.C.P.*

That purpura may be the result in some cases of mechanical strain in the circulation is clear from the consideration of the frequency of purpura in whooping-cough, in which the causes of the strain ascribed by Eason[1] are : (1) Dilatation of the right side of the heart ; (2) Active backward pressure during the fit of coughing, caused by the congestion of the lungs ; (3) Increased forward pressure, due to the increased action of the heart during the spasm ; (4) Vasomotor inadequacy ; (5) Stasis, active hyperæmia, and increased lateral pressure in consequence of causes 2, 3, and 4. Another instance of mechanical purpura is found in that accompanying the use of Bier's method of inducing hyperæmia, in cases in which the constriction exerted was too great. That a certain degree of hyperæmia is necessary as well as stasis is probable, for the author has remarked that in cases where there is from any reason a loss of neuro-vascular control resulting in a local vaso-paralytic hyperæmia, if pressure is exerted upon the area purpura will result ; but when the hyperæmia is absent, the same pressure is without this effect. The author does not cite the corroborating phenomenon of purpura associated with varicose veins—the frequency of which combination cannot but strike the dermatologist. It would indeed appear from the observation of the common sites of purpura, which, in the large majority of cases are on the lower limbs, that the length of the column of blood is an important factor, the capillaries in the lower extremities being from their position always subject to a certain degree of strain, which becomes more than can be supported when there is any interference with the delicately-adjusted vasomotor control. The author accidentally discovered that by applying a ligature to the limb of a person affected with purpura, the hæmorrhages increased in the area on the distal side of the ligature. The effect of rest in bed in causing the disappearance of purpuric eruptions corroborates the view that some part of the causation of these must depend on the pressure on the lower circulation exerted by the upright posture. Therefore, **Rest in Bed** should be always insisted upon, and astringent and vasomotor tonics prescribed, such as strychnine, digitalis, adrenalin, ergot, iron, and bitters.

Reference.—[1]*Scot. Med. and Surg. Jour.* Aug. 1908.

PYLORIC STENOSIS. (*See* Gastric, Pyloric, and Duodenal Ulcer.)

PYLORIC STENOSIS, CONGENITAL.

(*Vol.* 1908, p. 462)—Neild recommends small doses of **Opium**. One minim of tinct. opii is added to 1 oz. of water, and a teaspoonful of the mixture, that is, ½ m n. of the tincture, is given twenty minutes before each feed. By this means, it is said, operation may be obviated.

PYLORIC ULCER. (*See* Gastric, Pyloric, and Duodenal Ulcer.)

PYORRHŒA ALVEOLARIS.

In an article upon this subject read before the Annual Meeting of the British Dental Association,[1] Mr. J. Dencer Whittles alludes to this disease as the opprobrium of dental surgery. Of its etiology virtually nothing is known, knowledge of its pathology is almost equally lacking,

whilst prognosis is always unfavourable, treatment being rarely able to do more than mitigate the severity of symptoms and slightly check the course of the malady. In the majority of cases in which pyorrhœa establishes itself, it slowly progresses in spite of treatment, affecting tooth after tooth until the whole dentition is destroyed. It occurs in many instances in patients whose care of the teeth in the matter of cleanliness amounts to fastidiousness. In a large number of instances pyorrhœa is associated with disturbance of the general health. This disturbance is, as a rule, most noticeable in sensitive patients. In this class the constant discharge of pus of noisome smell, with the consciousness that their breath is tainted and its odour recognizable by others as well as by themselves, are enough alone to cause considerable depression. In cases of long standing it sometimes becomes a question whether the pyorrhœa has arisen from the lowered health, or the lowered health from the depressing effects of the local disease.

In a more recent article[2] the same author claims to have discovered a cure for the disease. He says, "I find that the disease may be cured by the local application of **Protargol**, with glycerin as a vehicle, on the terminal of a battery electrode, using a primary interrupted electric current of such a strength as not in any way to distress the patient. I fear that this troublesome disease is too often overlooked by the physician, and it may probably be the cause of many forms of toxæmia." He does not tell us in what way a primary interrupted electric current affects the local application of protargol. In a case when the extraction of all the teeth otherwise sound had been decided upon, and actually commenced, Percy Wilde suggested the following treatment, which was followed by complete recovery:—

℞ Lin. Iodi (B.P.) ℥ij | Aq. ad ℥iv

Sig.: The Paint. The gums to be painted with the solution twice daily, both anteriorly and posteriorly to the teeth.

Internally he gave ethereal tincture of phosphorus (1–1000), 3 minims after each meal, and well diluted. Sol. hydrarg. perchlor (1–1000) three minims between each meal. The treatment is worthy of a more extended trial, care being taken that the dose suggested be not exceeded. Iodine was selected because its power of penetrating the tissues gives it an advantage over other antiseptics.

References.—[1]*Brit. Dent. Jour.* Nov. 15, 1906; [2]*Brit. Med. Jour.* July 18, 1908.

QUINSY.

[*Vol.* 1906, p. 507]—A simple diagram shows the right point to aim at in opening a quinsy. The best instrument to use is a Liston's dressing forceps, with a point sharp enough to penetrate the pharyngeal wall. The opening is made large enough by separating the forceps.

RECTUM, SURGERY OF. *Sir Charles Ball, M.Ch., F.R.C.S.*

Excision of Rectum.—Arbuthnot Lane[1] recommends excision of the rectum for cancer in two stages, by the following plan:—

First Operation: Abdominal section by splitting the left rectus abdominis muscle, the patient being in the high Trendelenburg position.

A loop of pelvic colon is selected where the mesocolon is long, ligatured in two places, cut across, and the mesocolon divided down to its attachment. The upper end is left hanging out of the wound and attached to a drainage tube. It is well to leave as long a piece of gut as possible outside the abdomen, so that when the intestine to which the drainage tube is attached sloughs, the tube can be ligatured into a fresh piece of bowel. The lower portion of colon is cut away close to the site of disease, the lumen stitched up, and the line of suture inverted by sero-serous suture. Folds of parietal peritoneum are stitched together over the lower portion of rectum, so as to form a diaphragm shutting off the diseased area from the general peritoneal cavity.

Second (perineal) Operation : Two weeks after the first, the rectum is excised from below, the septum formed by stitching the folds of peritoneum together, separating the abdominal cavity from the field of operation.

Ashlet Baldwin[2] excised cancer of rectum by the abdomino-anal method. The patient was admitted to the West London Hospital for complete intestinal obstruction of ten days' duration. After laparotomy the intestine was opened for evacuation in several places. When the intestines had collapsed a carcinomatous growth was found in the rectum below the brim of the pelvis. The operation was temporarily completed by left inguinal colotomy, a Paul's tube being inserted. Five weeks after a second operation was undertaken for the removal of the growth. Owing to adhesions, great difficulty was experienced in freeing the rectum. The colotomy wound was closed and the bowel separated from the abdominal wall. The peritoneal and other attachments of the rectum were now divided, being ligatured, when necessary, before division. The bowel was freed until it was estimated that a loop of colon could be drawn down to the anus. The anus was well dilated by an assistant, and the loosened bowel, including the tumour, was forced out through the anus like a long intussusception. This was accomplished by a hand in the pelvis forcing the bowel downwards, and by means of an ovum forceps which had been passed up through the anus to a point in the rectum immediately below the growth, a piece of tape was tied tightly round the rectum, on the neck of the forceps below its expanded blades, so that traction on the handles helped to protrude the bowel. The intussusception was cut off externally to the anus, and the ends of the bowel were united by circular suture and allowed to drop back above the sphincters; while this was being done an assistant closed the abdominal wound, having previously filled the peritoneum with hot saline solution. The patient made a good recovery, with perfect sphincteric control.

Prof. Voelcker,[3] Heidelberg, in a discussion at the International Society of Surgery, considered the abdomino-perineal seemed to be the operation of the future, but its technique required improvement. At present the abdomino-perineal operation was not more dangerous in women than the perineal, and gave better results, but in men it was much the more dangerous of the two, being attended with a

mortality of nearly 40 per cent. Prof. Czerny did not favour extensive sacral resection for cancer in difficult cases: he preferred the combined abdomino-perineal route. M. Hartmann, Paris, had performed resection for cancer of the rectum in 49 cases during the last 12 years, 3 abdomino-perineal operations with 3 deaths, 26 high operations opening peritoneum with 3 deaths, 19 operations without opening peritoneum with 2 deaths, a total mortality of 14 per cent. The late results were followed in 20 cases: 10 showed recurrences and 9 were well and free from recurrence at periods from sixteen months to eight years. Dr. Bachrach reported on 320 cases of rectal cancer from Hockenegg's clinic. The operative mortality was 13 per cent, and there was permanent cure three years afterwards in 17 per cent. Hockenegg had performed the abdomino-sacral operation in eight cases only, with five deaths; he considered it only necessary when the pelvic colon was so fixed by adhesions that it could not be brought down by the sacral route.

Cecil Rowntree[4] describes a case of sarcoma of rectum in a boy aged 10 years.

Spontaneous Rupture of Rectum.—L. Burkhardt[5] records an interesting case of this rare injury.

A young man aged 17, apparently otherwise in perfect health, while making a violent effort at defæcation was seized with severe pain in the lower part of the abdomen, and he was conscious of a tearing sensation; this was followed by the discharge of some blood from the anus; the following day he applied to Prof. Enderlen's clinic, somewhat collapsed, with rigid abdomen, some vomiting, rapid pulse, and all the signs of peritonitis.

Digital examination revealed the presence of a depression like the opening of a diverticulum on the anterior aspect of the rectum, and the examining finger upon removal was smeared with blood; otherwise the rectum and anus appeared to be normal.

Laparotomy was at once performed in the middle line below the navel. Fæcal fluid was found free in the peritoneal cavity, and the coils of intestine were hypervascular and covered with flakes of lymph. After thorough washing with normal saline solution, the leak in the rectum and its overlying peritoneum were located at the base of the rectovesical peritoneal reflection. From its situation it was found impracticable to suture the tear; iliac colotomy was therefore performed, and the cavity of the pelvis plugged with gauze. The patient made a good recovery, and twenty-six days afterwards the colotomy was closed. Examination of the rectum by a speculum showed the rent soundly healed and the mucous membrane intact over it.

Reference is made to the cases hitherto collected of this interesting injury, and especially to Heineke's paper (see *Medical Annual* for 1908). The mechanism of spontaneous rupture of the normal rectum is somewhat difficult to understand; it appears probable that the direction of the tear is from without inwards towards the rectum, the intra-abdominal pressure from muscular contraction of the abdominal wall at the moment of defæcation not being opposed by the pelvic diaphragm, as the latter muscle is relaxed as much as possible to allow evacuation of the rectum. This argument is further strengthened by the fact that a considerable proportion of the recorded cases were associated with prolapse of the rectum.

Ulcerative Proctitis.—F. C. Wallis and W. Ironside Bruce[6] contributed a paper on this subject to the Surgical Section of the Royal Society of Medicine. After discussing the various forms of ulceration of the rectum, the authors refer to a case of colitis reported in 1905 by Dr. J. Curtis Webb, which was treated by **Electric Enemata.** After washing out the bowel, a solution of silver nitrate 0·1 per cent was injected through a rectal tube, the interior of which contained a copper wire that could be connected with the positive pole of a battery; large clay electrodes were placed on the back and abdomen and connected with the negative pole. A current of 15–20 ma. was passed for fifteen minutes. The result of this treatment was practically a cure, as all symptoms disappeared and the motions became natural in consistency and frequency. Ten electric enemata were given in all.

As the introduction of **Zinc Ions** into the tissues by means of galvanic currents had been exceedingly useful in the hands of H. Lewis Jones and others in the treatment of rodent ulcer, Wallis and Bruce tried this plan in severe ulcerative proctitis. The necessary apparatus is a zinc rod six inches in length, with suitable connection at the end for attachment to the positive pole of a galvanic battery; the zinc rod is covered with four layers of lint saturated with a 4 per cent solution of zinc sulphate; the negative electrode is soaked in plain water to insure contact. The patient being suitably placed lying on the side, with the aid of a lubricant the zinc rod with its covering is introduced into the rectum to a distance well above the ulcerated area. The indifferent electrode is placed under the patient or on the abdomen, and attached to the negative pole of the battery. A current of 20 ma. is passed for two minutes, then raised to 30 ma. for a further ten minutes. The treatment is to be repeated every two weeks.

For more extensive disease of the rectum the authors have constructed a special electrode, consisting of a hollow zinc tube, connected with a rubber bag which can be distended so as to occlude the bowel above the site of disease,. The rectum below the occluding bag is distended with zinc sulphate solution. The lower end of the zinc tube is insulated to protect the anal canal if this is free from disease.

References.—[1]*Lancet*, 1908, vol. i. p. 418; [2]*Brit. Med. Jour.* July 18, 1908; [3]*Ibid.* Oct. 24, 1908; [4]*Proc. Roy. Soc. Med.* vol. i. No. 4, p. 124; [5]*Münch. med. Woch.* June 16, 1908; [6]*Lancet*, May 23, 1908.

RETINA, DISEASES OF. *Ernest E. Maddox, M.D., F.R.C.S.*

Metastatic Infection of the Retina.—An interesting case has been recorded by Holmes Spicer,[1] in which an *abscess of the retina* was caused by *boils*, these latter in their turn being produced by what rowers call "raws," resulting from friction of the buttocks and thighs against the seat of a boat. After ascertaining the nature of the abscess by passing a cutting needle through the sclerotic between the external and inferior recti, under a direct ophthalmoscopic examination, he enucleated the eye. Holmes Spicer suggests that infection may be conveyed from one person to another by the seat of the boat. The

explanation given is the usual one, that some of the organisms gained entrance into the blood-current and were deposited as an embolus in one of the small vessels of the retina, so as to cause a solitary pyæmic abscess. Enucleation was followed by speedy recovery of this patient. Again, a skin abscess in the neck was responsible for *phlebitis of the retina*, in a case seen by Mr. Nettleship. The left eye exhibited severe hæmorrhagic retinitis with œdema and much white sheathing of certain veins. It was diagnosed as "phlebitis of terminal radicles, gradually spreading in the direction of the blood-current and leading to thrombosis." Recrudescence occurred about four years later, and again two years after that. Holmes Spicer suggests that in cases of this kind there was incapsulation of the organisms, or their return to a quiescent or germ stage, with ultimate resumption of active growth. Yet another instance, acute *retinal phlebitis with local keratitis profunda*, ensued upon diarrhœa from *ptomaine poisoning*. In this case, as in the last, retinitis proliferans followed. *Detachment of the retina* from infection by *boils* is also recorded by Holmes Spicer; the subretinal fluid was white, many brilliant glistening dots being scattered about the exudation area as well as elsewhere. The affection thus described differs from the previous ones by appearing to involve the choroid rather than the retina. Spicer thinks that the well-known instances in which there is a solitary acute inflammatory exudation into the choroid at one spot, with surrounding haze of vitreous, which subsides after a period of weeks, leaving an atrophied spot in the choroid, with no history or suspicion of tubercle or syphilis, might well be explained by a metastatic infection of the eye by some pyogenic organism from another part of the body.

Devereux Marshall records a case of *suppuration of the eyeball* eight days after a needling for lamellar cataract, the suppuration having probably come from a purulent focus in the finger. In this case it may be suggested that the embolic explanation is not so applicable as that the pathogenic microbes circulating in the blood-stream encountered tissues with diminished resisting power owing to trauma of the operation; and it emphasizes the importance of excluding every source of distant infection before opening the coats of the eyeball. It not infrequently happens that a low grade of iritis follows cataract extraction owing to insufficient care of the teeth. Next to them the nasal cavities require most care. Boils, or even suppurating spots of acne, should be regarded with suspicion and treated, either by their appropriate vaccines or by yeast preparations.

Cases of metastatic optic neuritis are described in the section on the Optic Nerve.

Detachment of Retina.—The treatment of this affection still continues to be unsatisfactory, save in a very small minority of cases. Sub-conjunctival saline injections appear sometimes to do moderate good, but their efficacy is certainly very small. Rest in bed, with bandaging of the eye, and pilocarpine injections, avoidance of drinking much liquid, and the encouragement of perspiration, still continues to be

the best form of treatment we have, though in a few cases repeated puncturing of the sclera with a knife, or better still with a cautery, leads to happy results. Heurtelouping the temple finds favour with some. In desperate cases Deutschmann[2] still advocates injection of the vitreous of a rabbit into the vitreous chamber, beginning with a diluted vitreous, and states that of 220 eyes which he submitted to this treatment, 52 were cured. I obtained moderate success in one case by puncturing the sclera opposite the detachment, to evacuate the serum, and by then injecting physiological salt solution through a minute puncture at the ora serrata into the vitreous.

A unique case recorded by Remak[3] is that of a woman, 57 years of age, whose detachment, involving the upper half of the retina in the right eye, gradually sank by gravity as usual, and in spite of some transitory benefit from rest cure, "remained the same for about one and a half years. At this time, while walking in the twilight, and as a result of defective vision on that side, the right side of her head came into violent contact with a tree. She fell to the ground, and there was considerable hæmorrhage. Following this accident the eye gradually began to improve, until within three months her vision became practically normal." What makes this case so extraordinary is that nothing generally aggravates a detachment more than just such a knock on the head. It is possible, as Levy suggests, that the blow may have ruptured the detached retina and allowed the sub-retinal fluid to escape into the vitreous, and the replaced retina might have been kept in position by organizing blood-clot. A more likely explanation is that profuse loss of blood led to the absorption of the subretinal fluid by the depleted vascular system.

References.—[1]*Ophthalmoscope*, 1907, p. 230; [2]*Ibid.* 1908, p. 814; [3]*Ibid.*

RHEUMATOID ARTHRITIS. *Robt. Hutchison, M.D.*

A discussion on this subject took place at the meeting of the British Medical Association in 1907.[1] All of the speakers were agreed as to the importance of an abundant and nutritious **Diet** containing plenty of animal ingredients, and of the dangers of cutting down the supply of nitrogenous food under the mistaken impression that the disease is related to gout. As regards **Climate,** damp and cold places are to be avoided. The seaside is rarely suitable. As a winter resort there is no better climate than Egypt.

The **Thermal Treatment** of the affected joints, either by means of baths, superheated air, or electric-light baths, is most beneficial. Douche massage is the most effective form of treatment with hot water, and perhaps next to that rank peat baths and brine baths. Electric-light baths, in which the affected joints are bathed in the heat and light rays reflected from a number of incandescent electric lamps, are also beneficial in many cases. Properly-regulated movements and properly-applied massage are of great use in overcoming the stiffening and fixation of the joints and the muscular wasting in their vicinity.

During the acute stages the joints should be handled gently, but

light rubbing is usually possible, and certainly should be begun as soon as the more acute features show signs of subsiding. With this the patient should be encouraged to move the joints himself, and taught how to give kneading movements to as many joints as possible. Simple exercises can soon be begun, at first few in number, and increased gradually. The more of these the patient does himself the better. Another measure of great aid is the application of the **Bier Method** of producing hyperæmia. This may be done even when the joints are actually inflamed, and often gives great relief to the pain. The duration of this treatment can be gradually increased. Counter-irritation may be employed, perhaps best in the **Paquelin Cautery** lightly applied. In arthritis of the spine it is usually found that rest is important. This may be attained by the application of starch or plaster bandages, to be replaced later by some form of support.

The drugs that Luff has found most useful are **Guaiacol** and **Potassium Iodide.** He has now used guaiacol in over 3000 cases, and does not hesitate to say that, if administered in sufficient quantities, and for a sufficiently long period of time, it is capable in the great majority of cases of arresting the disease, of diminishing the size of the joints, and of permitting increased movements. It also relieves pain markedly. It is useful in both the subacute and chronic forms of rheumatoid arthritis. The guaiacol probably acts by inhibiting the growth of the specific micro-organisms in the intestinal tract, and after absorption by combining with the bacterial toxins and assisting in their elimination. The iodide of potassium probably acts by promoting absorption of the hypertrophied fibrous tissues.

The most convenient form of administering the guaiacol is the carbonate in cachets. This salt is a white powder which is free from the disagreeable odour, taste, and irritating effects on the stomach of guaiacol itself. In the intestines it is slowly split up into guaiacol and carbonic acid gas. At first from 5 to 10 gr. of the carbonate of guaiacol should be given three times a day, and the dose should be increased by 1 to 2 gr. each week until from 15 to 20 gr. are being taken in each dose. It is essential that this treatment should be continued for at least twelve months. The beneficial effects of the guaiacol are very much increased by administering at the same time a mixture containing potassium iodide ; the depressing effect of the iodide should be counteracted by its combination with tonics.

Middleton[2] claims to have obtained good results from **Counter-irritation of the Spine** according to the method first proposed by Latham.[3] To be successful the irritation "must be pronounced and prolonged and *applied at the right spots.*" He describes the following, amongst other cases, which will illustrate the method of carrying out the treatment, and its results : —

The patient, a married woman, 43 years of age, consulted me in December, 1900. About the middle of 1898 she began to notice tenderness in the feet, neuralgic pains in the limbs, and vague pains in the joints. About six months later she noticed distinct swelling of the wrists and knees, then of the

finger-joints of both hands, and then of the ankles. Notwithstanding treatment at Bath, Buxton, and elsewhere, she wasted to a mere skeleton, and was unable to move hand or foot. On March 18th, 1901, I persuaded her with some difficulty to try the effect of counter-irritation of the spine by means of blisters. Two were consequently applied, each 4 by 1½ inches in size, one on each side of the spine, the upper edges opposite the tenth dorsal vertebra, with a view to influencing the lumbar enlargement of the spinal cord. The blistered surfaces were kept discharging for fourteen days by means of savin and resin ointments applied daily. On April 12th the patient said that the pain in the knees and legs was less, and passive movements of the legs could be carried out with greater ease and thoroughness than before. On the 16th blisters of the same size were applied on each side of the cervical enlargement of the spinal cord. On the 19th she said that she had more sensation in her feet. The blistered surfaces were treated with savin and resin ointments as before, and kept open for fourteen days. On May 7th there was found to be all-round improvement. The patient wrote a long letter to a friend. It was the first time she had used a pen for over a year. On the 28th the knees were much less swollen. On June 19th she was much better, and was allowed out of doors several hours daily. The digestion was better and she was gaining weight. On the 20th blisters were again applied to the lumbar region, and treatment was carried out as before, and afterwards to the cervical region. On July 18th the knees were much better; the right leg could now be straightened; it was much bent previously. On the 30th the patient was able to walk a little. On Sept. 16th she went to Buxton. "Chair patient." On Feb. 5th, 1902, she could do part of her own housework. In September she went to Buxton, no longer a "chair patient." The patient eventually resumed her household duties, even doing her own washing, and has kept well nourished and active ever since.

REFERENCES.—[1]*Brit. Med. Jour.* Oct. 26, 1907; [2]*Lancet*, Sept. 28, 1907; [3]*Ibid.* April 6, 1901.

RHINITIS (Atrophic, Membranous). (*See* NOSE, DISEASES OF.)

RICKETS. *Prof. G. F. Still, M.D., F.R.C.P.*

From time to time new theories are propounded of the etiology of rickets, but none can be satisfactory which fail to recognize that rickets can be produced by faults of diet, and that there are certain types of diet upon which the occurrence of rickets is practically a certainty whatever the environment of the infant may be.

Esser[1] states a theory based upon examination of the blood; he found that the neutrophile leucocytes of babies who were chronically overfed contained fewer nuclear fragments than those of infants properly fed; this was specially noticed in hand-fed infants, and in infants with rickets. The blood in rickets shows also a polymorphonuclear leucocytosis and a diminution of the mononuclear forms supposed to originate in the bone-marrow. Enquiry showed that in rickets there was a history of overfeeding, and experiments on rats showed that rickets could be produced by overfeeding. Esser regards the changes in the blood as depending upon an excessive functionating of the bone-marrow, which is consequently hyperæmic. The phenomena of rickets are, he thinks, explicable simply by overfeeding, and rickets can be cured by reducing the diet to a proper quantity.

Findlay[2] considers that confinement and lack of exercise are the main factors in the production of rickets; the part played by diet is unimportant. Lee[3] states that "if there is one cause of rickets more

common than another it is some form of pulmonary or bronchial inflammation, and it is singular how much this is overlooked."

All such hypotheses seem entirely to overlook the fact that rickets is curable and preventable by simple dietetic measures, without the least alteration of respiratory or ventilatory conditions. Evidence against such views is not far to seek in the familiar and effective treatment of rickets by cod-liver oil, which is carried out daily amongst the out-patients of children's hospitals without any change whatever of hygienic or respiratory conditions.

Bossi[1] has shown that removal of one suprarenal gland from sheep induced osteoporosis, and he suggests that rickets may be explained by some defect of this kind, or at any rate that adrenalin may be of value in the treatment of rickets.

TREATMENT.—Southworth[5] states that **Fresh Orange Juice** has a beneficial effect in rickets as well as in scurvy. **Cod-liver Oil** should be given in small quantity, gradually increased up to half a drachm or more three times a day. If this is not well borne, and especially in hot weather, pure **Olive Oil** has considerable value as a substitute. Special care should be taken that a sufficiency of proteid is given in the food, and in an infant of seven months or more this element may be increased by the administration once daily of beef-juice or the white of one egg mixed with the milk. For children over twelve months of age scraped raw meat and soft-boiled eggs are valuable. Starch indigestion is very common in rickety children; oatmeal and potato are better interdicted entirely in such cases, and other starchy foods, if given, should be limited to a small amount of thoroughly cooked and strained cereal of some other kind, or to zwieback or stale bread dried crisp in the oven. Total exclusion of starchy food is not always necessary. Cereal additions to milk add a considerable amount of vegetable proteid and mineral matter which are needed by some rachitic children. Southworth thinks **Phosphorus** is of great value in cutting short the more acute symptoms of rickets; he mentions a case in which $\frac{1}{200}$ gr. of phosphorus was given for rickets thrice daily in thirty minims of cod liver oil to a child about two years and four months old, and considers the rapid improvement which followed as a proof of the value of phosphorus. It seems, however, at least possible that in such cases the improvement is due rather to cod-liver oil, especially as a similar dose of cod-liver oil without any phosphorus is certainly productive of very rapid improvement in many cases.

REFERENCES.—[1]*Münch. med. Woch.* in *Arch. Pediatr.* Nov. 1907; [2]*Brit. Med. Jour.* July 4, 1908; [3]*Ibid.* Aug. 1, 1908; [4]*Ibid.* Sept. 19, 1908; [5]*Jour. Amer. Med. Assoc.* Jan. 11, 1908, in *Ther. Gaz.*

RINGWORM AND FAVUS.

E. Graham Little, M.D., F.R.C.P.

Munro and Harris[1] record their individual experience in the treatment of ringworm with **X Rays**, used on the lines recommended by Sabouraud, and with the dosage checked by his pastilles. They confirm the value

of these methods. Harris emphasizes the following points in the technique: (1) The work must be done in a dark room, as the pastilles become altered by daylight; (2) The anode of the tube must be exactly 15 cc. from the part under treatment, with the pastilles exactly midway, i.e., $7\frac{1}{2}$ cc. from the anode; (3) The tubes must be small, and the pastilles placed at least $2\frac{1}{2}$ in. from the glass of the bulb; (4) The inspection of the change of tint must be made rapidly and in daylight; (5) If the tint "B," which marks the completion of the required dosage, be exceeded, alopecia may result; if it be not attained, the result may be inconclusive. The harder tubes only should be used, and their quality carefully estimated by means of Benoist's radiochronometer. The areas treated begin to lose their hair about the fifteenth day, and complete alopecia is established about the thirty-fifth day. The whole scalp should be soaked with tincture of iodine 1, alcohol (80 per cent) 4, to prevent spread of infection to untreated parts and reinfection of the treated portion.

Cranston Low[2] has compiled some useful statistics of ringworm and favus, as seen at the Royal Infirmary, Edinburgh. Of ninety-eight cases recorded, eighty-six were due to small-spored fungus, twelve to large-spored; six cases of kerion occurred, of which four were small-spored, two large-spored. The routine method of treatment adopted was as follows: The child's hair was directed to be cut short all over the scalp, and thereafter the hair was to be cut once a week. The head was to be well scrubbed every night with a nail-brush, using soap-spirit (sapon. moll. 2, meth. spirit 1), and then washed out with warm water and the following ointment rubbed into the diseased areas night and morning:—

℞	Hydrarg. Ammon.	℥ss	Lanolini		℥j
	Sulph. Præcip.	℥j			

X Rays were used in addition to the above treatment in twenty-five cases, always with the consent of the parents after the risks were explained. The one-exposure method, with somewhat less than the time required by the Sabouraud pastilles, was used.

Thirty-nine new cases of favus appeared in sixteen months. A feature of interest which appears from these statistics, which comprise fifty-three cases, is the duration of the cases of favus before treatment was sought, and notwithstanding this, the slight degree of infection as compared with ringworm. The treatment adopted was the same as for ringworm, with the substitution of 10 per cent oleate of copper or resorcin ointment for the ammoniated mercury and sulphur ointment. X rays were used in addition in thirteen of the fifty-three cases. Unlike tinea, favus shows no tendency to spontaneous cure with the advent of puberty.

Sabouraud[3] formulates the current opinion on the position of ringworm and favus as follows:—

There are roughly three species of parasites so classed, probably with very close associations one with another. These classes are:

(1) The achorions, of the type of the *Achorion schonleinii*, or favus; (2) The microsporons, of the type of *Microsporon audouini*, small-spored ringworm; (3) The trichophytons, large-spored ringworm.

It will be noted that the plural is used in designating each of these three classes, and, in the present position of our knowledge, three types of achorion, eleven types of microsporon, and some twenty or more types of trichophyton are recognized. These species are separated from one another by peculiarities of culture: the same special test-medium being constantly employed, variations of growth upon it are regarded as indicating variations of species.

Favus.—Upon this basis of classification the following types of favus are at present known: (1) The ordinary *Achorion schonleinii*, with bright sulphur-yellow cups, and greyish culture, forming 99 per cent of the whole number of cases of favus of human beings; (2) A favus found in the mouse, producing a white culture; (3) A favus found in the horse, and isolated also in man, producing a shaggy brown culture. All three types give the typical clinical lesion, the cup surrounding the diseased hair.

The Microsporons.—Here the typical feature is the sheath of spores, which microscopically are seen to surround the hair like a mosaic. This is immeasurably the commonest form of ringworm in children, and was until recently supposed to be restricted to human beings; but now unmistakably microsporons have been isolated in the cat, dog, horse, guinea-pig, etc., and it has been possible to differentiate by cultural characters eleven such species.

The Trichophytons are distinguished microscopically by the arrangement of the spores in chains running along the long axis of the diseased hair. Their cultures may be grouped in four classes: (1) The acuminate or crateriform culture; this type has been observed only in man; (2) The velvety or powdery culture, common to animals and man; (3) The faviform culture, common to animals and man; (4) A new species, recently isolated, hitherto seen only in man, and called by Sabouraud the *Epidermophyton inguinale*, since it causes what has been called "eczema marginatum" of the groin.

In groups 2 and 3 there are eleven species which have been shown to be of animal origin—horses, oxen, asses, calves, pigs, deer, birds, cats, dogs, and other animals having been victims of this disease. It must be clearly understood that the four groups above detailed include very numerous species—about twenty up to the present date—differentiated by colour and other cultural characters.

Treatment.—This has been found to be similar in all three classes—achorion, microsporon, and trichophyton. When the hairy parts are affected, **Radiotherapy** is the method of election: when only cutaneous smooth surfaces are the seat of disease, painting the affected parts with a mixture of **Tinct. Iod.** 1, spt. vini. rect. 4, is rapidly successful.

Reference.—[1]*Austral. Med. Jour.* Oct. 21, 1907; [2]*Scot. Med. and Surg. Jour.* Aug. 1908; [3]*Brit. Med. Jour.* Oct. 10, 1908.

RODENT ULCER (Multiple). *E. Graham Little, M.D., F.R.C.P.*

Cases in which more than two rodent ulcers occur at the same time are very uncommon. Adamson[1] draws attention to two cases, one published by Bruce Clarke, the other by Pringle, in which there were respectively twenty and thirteen rodent ulcers simultaneously present, the histological examination in each instance confirming the clinical diagnosis. These cases suggest to Adamson a parallel with three cases, recorded as epithelioma adenoides cysticum, of Brooke, one by Stelwagon, one by J. C. White, and one by Jarisch, and the reports of the histological examination of these three cases are strongly suggestive of rodent ulcer. Upon recalling the description of the original cases of Brooke recorded by him under the title epithelioma adenoides cysticum, and the cases since described, which are probably of the same type, Adamson insists upon the following common points: (1) All occurred in women, and in all except one instance in mother and daughter; (2) The lesions consisted of pearly white or faintly bluish or yellowish nodules, appearing in early life and seated mainly on the face; (3) The lesions showed no tendency to crust or break down or become even locally malignant. Milia occurred on the lesions and also on other parts.

Histologically, the lesions of rodent ulcer have many features in common with those of epithelioma adenoides cysticum; in each case the lesion is made up of an epithelial growth derived from the basal layer of the epidermis or from that of the hair follicle; in both, the epithelial masses have newly-formed encapsuling fibrous tissue, but in Brooke's disease this is highly organized, non-proliferating; in rodent ulcer it is highly cellular and proliferating, and there are locally malignant epithelial invasions of surrounding tissue.

REFERENCE.—[1]*Lancet*, Oct. 17, 1908.

RUBELLA. *E. W. Goodall, M.D.*

Rubella formed the subject of a discussion in the Epidemiological Section of the Royal Society of Medicine in January, 1908. The discussion was opened by papers on the subject read by H. E. Corbin and the writer of this note,[1] and in the discussion several superintendents of fever hospitals and medical officers of health took part. Not one of the speakers expressed any disbelief in the existence of the disease, and most of them stated that usually it was not difficult to distinguish it from scarlet fever and measles. Rubella is not a notifiable disease, nor is it a fatal disease, so that evidence as to its yearly and seasonal prevalence is difficult to obtain. From time to time limited outbreaks have been reported by various observers, but these give a very poor idea of the real prevalence. But Corbin's paper affords some valuable evidence on this point, so far as London is concerned. In that paper figures are given of the admissions of rubella into the London Fever Hospital for the twenty-one years 1887–1907. The disease, as such, is admitted into that hospital, and does not obtain an entrance merely by accident, as is the case

in most fever hospitals. During the years in question 1523 cases were admitted, and it was found that, taking the number of admissions as evidence of the prevalence of the disease, there was an epidemic of greater or less magnitude every three or four years. The best marked epidemics were in the years 1888, 1891, 1892, 1895, 1898, 1900, 1901, 1904, and 1907. The disease appears to have been especially prevalent in 1898, 1900, 1901, and 1907; in this last year, indeed, from statements that were made during the discussion and from information given to the writer, the disease appears to have been unusually prevalent all over the United Kingdom. The seasonal incidence of rubella was also demonstrated in the paper referred to. It seems that the disease is prevalent, when at all, during the spring and early summer, May being the month of greatest prevalence. In this respect the affection differs from measles, which is a disease of the late autumn, winter, and early spring. The age-incidence differs, too, from that of measles. The bulk of the measles cases are seen in children under ten years of age, and, it is comparatively seldom met with in adults. Rubella, on the other hand, is commonly seen in persons up to thirty years of age, and not rarely up to forty. But while rubella may at times be very prevalent, it does not seem to be a highly infectious disease. The writer brought forward several instances in which a single case of the disease occurred in a ward full of children without any more cases arising, even though the patient was not removed from the ward: and Corbin stated that both rubella and measles were admitted into the same wards at the London Fever Hospital, and that during the two years he had been in charge of the hospital (1906 and 1907) not one patient with either of the diseases had developed the other. Doubtless, many of the patients who were suffering from rubella, being big children or adults, had previously suffered from measles; but it was unlikely that many of the measles cases had previously had rubella. Corbin inclines to the belief that the infectiousness of rubella is at its maximum during the short prodromal period of twenty-four hours which occurs before the eruption is manifest, and that it declines rapidly during the following twenty-four hours, disappearing entirely at the end of this period unless faucial catarrh persists.

According to the observations of the writer, the following are the most common clinical features of rubella:—

Prodromal Period.—Often absent; if present, seldom more than twenty-four hours. The symptoms are sore throat, vomiting, enlargement of the lymphatic glands, especially of the neck, and moderate pyrexia. Less frequent are shivering, headache, giddiness, coryza, and pain in the back and limbs. Claude Ker, of Edinburgh, however, stated in the discussion that 101 cases out of 200 which he had seen had distinct symptoms twenty-four hours before the rash appeared; 18 cases over two days before; 21 cases three days before; 7 cases four days; and 8 cases from five to seven days before the rash occurred. Most of Ker's cases were adults, while most of the writer's were children. It is quite possible that prodromal symptoms are

actually more frequent in adults than children ; and even if they are equally present in both sets of patients, as they are seldom severe they are more noticed by adults than children. According to Ker the prodromal symptoms are coryza, headache, sore-throat, stiff-neck, malaise, and nausea ; but vomiting was exceptional.

Rash.—This may be the first sign of the disease. It consists of pale pink spots, which come out first on the face and scalp, and within two or three days invade the skin of the trunk and extremities from above downwards. In some cases the rash comes out very quickly and simultaneously all over the skin. The spots may disappear without becoming confluent, they may become confluent to form macules, and they may become confluent to form a diffuse erythema closely resembling that of scarlet fever.

Glands.—The superficial lymphatic glands are often moderately enlarged and tender ; those most commonly affected are the mastoid and posterior cervical.

Pyrexia.—Seldom is there much rise of temperature. There may be no rise at all. If the temperature is elevated, it seldom remains so for more than a few hours.

Eyes.—The conjunctivæ are often injected, but not infrequently they are unaffected. F. Foord Caiger stated that in his opinion when the conjunctivæ were definitely affected, it was part of the hyperæmia of the face generally.

Desquamation may occur. It is usually slight, consisting of small branny scales ; but it may be profuse. Rarely is it of the " pin-hole " variety.

Incubation Period.—This varies from ten to twenty-one days ; it is commonly fifteen to eighteen.

The existence of the so-called " *Fourth Disease* " was also the subject of discussion. It will be remembered that Clement Dukes in the year 1900 attempted to separate this disease from rubella, with which he believed it had been confounded. As far back as 1885 Filatow, of Moscow, had made the same attempt. But the opinion of those who took part in the discussion was that no case had been made out for the existence of the " fourth disease."

REFERENCE.—[1]*Proc. Roy. Soc. Med.* (Epid. Sect.) Feb. 1908.

SALIVARY FISTULA.

(*Vol.* 1902, p. 517)—In cases where, owing to the formation of much scar tissue or to the fistula being posteriorly situated, the usual operation is ineffective, the following procedure may be employed. Incise in the direction of the duct ; dissect out its outer portion, together with the masseteric prolongation of the parotid gland. Separate the opposed margins of the gland and the masseter muscle, then detach the inner surface of the masseter from the outer surface of the ascending ramus of the mandible. Finally, thrust the dissected portion of gland between the masseter and bone, and through an opening made in the buccal mucosa, to the edges of which it is sutured.

SALPINGITIS, SUBACUTE.

(*Vol.* 1908, p. 244)—Operation is to be postponed so long as a prospect of recovery by other means manifests itself. Absorption is aided by the local application of **Ichthyol** and **Glycerin**, with small doses of **Mercury** and **Potassium Iodide** internally. Wilson also recommends the **Electric Bath.**

SCARLET FEVER.

E. W. Goodall, M.D.

Pathology.—In an examination by Gordon's tests of streptococci found in cultures taken from the throats, noses, and ears of scarlet fever patients, Harold Kerr[1] found that only 9 per cent of the streptococci were of the conglomerate form, whereas they constituted 16 per cent of the streptococci obtained from healthy throats, and 26 per cent of those from morbid conditions of the throat other than scarlet fever. This evidence is against the view held by some authorities that the *Streptococcus conglomeratus* is the micro-organism of scarlet fever.

Sidney P. Phillips[2] records a case of scarlet fever in a young woman aged 27, in which on the twelfth day of the illness jaundice appeared, and a tender swelling could be felt deep in the region of the pancreas. The swelling increased in size, and the jaundice became deeper during the following days. Then the right parotid gland became swollen and painful. Phillips ascribes the jaundice to pressure of an enlarged head of the pancreas on the common bile-duct.

Treatment.—H. Cumpston[3] treated thirty-seven cases of scarlatina anginosa (septic scarlet fever) with **Polyvalent Antistreptococcic Serum.** Eleven of the cases died—two of chronic heart disease not connected with the scarlet fever. He states that "observation of these cases leaves the distinct impression that the injection of the 'antiscarlatinal' serum in large enough doses (not less than 50 cc.) and early enough in the disease—that is, as soon as the onset of rhinorrhœa, swelling of cervical glands, and superadded rise of temperature, the signs of septic invasion, occurred—will produce a marked improvement in 'septic' cases." The writer, from his experience at the Eastern Hospital, is able to confirm these observations.

The serum was supplied by Messrs. Burroughs & Wellcome, and was obtained from horses immunized against cultures of streptococci which had been isolated from various cases of scarlet fever.

References.—[1]*Lancet*, Vp. 4, 1908; [2]*Ibid.* Mar. 21, 1908; [3]*Brit. Med. Jour.* May 30, 1908.

SCHLÄTTER'S DISEASE.

(*See* Bones, Rare Surgical Injuries of.)

SCHOTT TREATMENT OF HEART DISEASE.

(*Vol.* 1905, p. 318)—This method of treatment is suitable for patients with the dilated, feeble, excitable heart that is sometimes left by an attack of influenza and other infections; for the dilated heart of high arterial tension; and for the heart of chronic nicotinism. Some cases of chronic valvular disease may be greatly benefited. Alcoholic and syphilitic affections of the myocardium, aortic regurgitation, the cardiopathies of atheromatous and very old people, are all unsuitable for the Nauheim system.

SCIATICA.

(*See also* Neuralgia.)

Purves Stewart, M.D.

In a lecture to the Medical College of Cologne, Schultze,[1] of Bonn, gives a useful *résumé* of his experiences of sciatica in hospital practice during the last eighteen years. His cases, 104 in number, belonged to the class of so-called rheumatic sciatica. Of these, ninety-three were in men and only eleven in women. This overwhelming pre-

ponderance in the male sex is in accordance with the experience of most other observers, and shows that sciatica is not referable to psychical causes or to hysteria; otherwise it would be commoner in women. Middle-aged patients were most commonly affected, especially those whose daily occupation exposed them to frequent changes of temperature, to severe muscular exertion, or to traumata. Neither gout nor diabetes had any causal influence, nor, contrary to the statements of many books, was constipation a recognizable cause. The left side was nearly twice as often affected as the right. According to the patients' histories, the chief exciting causes were chill, accident, "heaving" efforts, and previous lumbago. With regard to lumbago, Schultze regards the sacro-lumbar muscles as a relatively less likely seat of trouble than the deep ligaments and connective tissues. As to symptomatology, in fifty-five cases where the Achilles-reflex was tested, it was found absent on the affected side in twenty-two. The knee-jerk, of course, was normal. It was not uncommon to find diffuse tenderness to pressure over the whole gluteal region, not confined to special "tender points." The frequency of absence of the Achilles-jerk, together with the common occurrence of diminished cutaneous sensibility, leads Schultze to regard ordinary rheumatic sciatica as essentially inflammatory in origin, mainly a perineuritis, together with implication of the adjacent connective tissue structures. This view is further supported by the fact that in sciatica, as in most cases of neuritis, we have to do with a continuous pain, not with short paroxysms followed by intervals of complete relief. The diffuse tenderness of the gluteal region also favours the view that the sciatic pain is directly continuous with that of a lumbago. Operation undertaken in two of Schultze's patients showed that the nerve-trunk was red and surrounded by web-like adhesions; it is therefore probable that in some inveterate cases adhesions may form between the nerve-sheath and the adjacent bones and ligaments.

TREATMENT.—In recent cases Schultze recommends absolute **Rest in Bed,** with **Salicylic** medication, especially in the form of **Aspirin,** and of course **Anti-neuralgic Drugs** in addition. Blisters, according to Schultze, render the recumbent position too painful. In chronic sciatica he recommends **Hot Sand-baths** and **Scotch Douches. Operation** may be necessary in obstinate cases. He discourages massage, especially in recent and acute cases.

Ironside Bruce[2] has called attention to the frequency with which chronic sciatica is a secondary result of arthritic changes in the hip-joint. Many cases of old-standing sciatica have changes in the hip which are demonstrable by radiography, whether this arthritis be osteo-arthritic, gouty, or some other form of chronic inflammation. By comparing radiograms of the sound and of the affected side, he found definite changes in the outline of the bones in five cases out of twelve. This would indicate that in some cases sciatica is not a primary affection of the nerve but a secondary effect of hip disease. He does not claim that all cases of chronic arthritis of the hip are

associated with sciatica. He directs attention, however, to the frequency with which sciatica is associated with wasting of the gluteal muscles which are not supplied by the sciatic nerve. Such muscular wasting points to hip-joint affection. Moreover, the most successful treatment of chronic sciatica, namely, absolute rest, of necessity involves rest of the joint. Observations like these should remind us to investigate carefully the hip joint in all cases of chronic sciatic pain.

REFERENCES.—[1]*Zeits. f. inn. Med.* June 15, 1907; [2]*Pract.* Ap. 1908.

SCURVY, INFANTILE.

(*Vol.* 1904, p. 633)—**Unboiled Milk** is valuable both in the prevention and the cure. **Orange** or **Grape Juice**, and **Raw Meat Juice**, are also useful antiscorbutics. For pain, small doses of **Morphia** may be administered.

SEPTICÆMIA.

(*Vol.* 1908, p. 57)—In two cases of general streptococcal infection complete recovery has followed the injection of a **Vaccine** made from cultures of the organism in the patient's blood, while other methods (including extraneous vaccines) had proved useless.

SHOCK, SURGICAL.

(*Vol.* 1906, p. 447)—**Saline Infusion**, whether intravenous or hypodermic, should be practised early without waiting for dangerous symptoms. Moderate quantities (about one pint), repeated several times, are better than single large quantities. **Adrenalin** 1–20,000 given with the infusion is especially useful if the quantity is so regulated as to maintain a steady blood-pressure. **Morphia** hypodermically before operation decreases the risk of shock. **Ether** or **C.E. Mixture** is better than chloroform for long operations. For amputations at the hip or shoulder, or for cases of extensive injury to the limbs, **Cocaine** injection into the brachial plexus or into the sciatic and anterior crural nerves tends to diminish shock.

SIGMOIDITIS.

Robt. Hutchison, M.D.

This condition, which was first described by Mayor,[1] is gaining general recognition, and is probably much commoner than has hitherto been supposed. In an elaborate review of the whole subject Patel[2] classifies the varieties of the affection as follows:—

1. *Specific* or *Secondary Sigmoiditis*, e.g., from syphilis, dysentery, or tuberculosis.
2. *Primary Acute Sigmoiditis.*
3. *Suppurative Perisigmoiditis.*
4. *Chronic Sigmoiditis and Perisigmoiditis:* (*a*) Chronic sigmoiditis; (*b*) Chronic perisigmoiditis; (*c*) Subacute perisigmoiditis; (*d*) Inflammatory contraction of the sigmoid.
5. *Sigmoiditis with General Peritonitis.*

He admits, however, that this classification is to some extent artificial, and that no hard-and-fast line can be drawn between the different varieties.

Amongst predisposing causes of the disease he attributes most importance to the anatomical form of the sigmoid loop, to the presence of diverticula in its wall, and to constipation. The exciting cause is to be regarded as an invasion of the wall of the sigmoid by pathogenic bacteria. The diagnosis of sigmoiditis in general is not difficult if one is alive to the fact of its occurrence. The chief symptoms are pain referred to the left iliac fossa and radiating to the hip, fever (in acute

cases), local tenderness and resistance on palpation, more or less thickening, or tumour formation, if there be perisigmoiditis, and the presence of diarrhœa or constipation, depending upon the stage and variety of the complaint. The use of the sigmoidoscope is of great help in diagnosis, especially in the chronic cases. Perimetritis is the condition which is most likely to lead to error in diagnosis, especially as sigmoiditis and perisigmoiditis seem rather prone to occur during the puerperium, as has been pointed out by Lehmann.[3] The treatment of sigmoiditis is the same as that of catarrhal or mucous colitis. For the treatment of perisigmoiditis the reader is referred to an article ("Pericolitis Sinistra") in the *Annual* for 1906.

REFERENCES.—[1]*Rev. Méd. de la Suisse Romande*, 1893, p. 421 ; [2]*Rev. de Chir.* Oct. 10, 1907 ; [3]*Berl. klin. Woch.* April 13, 1908.

SKIN, DISEASES OF. (*See also special articles.*)

E. Graham Little, M.D., F.R.C.P.

Errors in Diagnosis.—Bulkley[1] gives some useful hints on certain common errors to be avoided in the diagnosis and treatment of skin diseases. The co-existence of two or even more diseases of the skin in the same patient is a frequent source of difficulty which must be kept in mind. His remarks on syphilis as an imitator of other diseases call to mind the old apothegm, "when in doubt, think of syphilis." Thus syphilis may resemble epithelioma, lupus, sycosis : chancres of the tonsil have been mistaken for diphtheritic exudate, and extra-genital chancres are a fruitful source of difficulty ; so that the diagnosis of the disease frequently must be left until the appearance of secondary eruption. The appearance of scabies and pediculosis in patients whose position in life would appear to negative the possibility of such infections often affords puzzles in diagnosis. Similarly in ringworm and favus, difficulties may arise which, insomuch as they are so easily solved by the use of the microscope, should not remain unsolved with a proper routine employment of that method of examination. The mistaking of eczema for erysipelas is a common error which the entirely different clinical course of the two diseases should preclude. Drug eruptions may closely imitate the exanthemata ; quinine and belladonna may produce rashes like that of scarlet fever ; iodides may cause lesions simulating syphilis, an unfortunate error which usually leads to increasing the dose and so accentuating the manifestation. Success in treatment is only to be obtained by forming a clear idea of the results aimed at, and in careful direction and supervision of the patient over a period long enough to give the treatment a proper chance. The pursuit of "cures" is baneful to the patient as well as to the physician. Much of the chronicity of diseases of the skin is due to ill-considered methods. The abuse of arsenic, the overlooking of severe constitutional disease such as malaria, the neglect of dietetic precautions, are all errors of sufficient frequency to need mention.

With regard to local measures, the insistence of advertised drugs is responsible for much ill-considered medication, and it is better to

deal with few drugs, the action and use of which are familiar, than to experiment with imperfect knowledge of many. The investigation of the general condition of the patient, and of the state of metabolism as revealed by the urine, the avoidance of vigorous treatment when the diagnosis remains uncertain, and especially of local measures in syphilis; the avoidance of local applications of nitrate of silver on superficial sores, are well insisted upon as a result of the writer's wide individual experience.

General Therapeutics.—Max Joseph[2] discusses the general principles which should be observed in skin medication. Since **Soaps** all have the action of softening and removing the surface cells of the epidermis, they are indicated where this is a desirable end, e.g. in psoriasis; contraindicated in conditions such as eczema, where every effort should be made to regenerate the epidermis. In "wet" diseases, such as exudative eczema, a weak solution of **Aluminium Acetate,** or a lotion of **Resorcin** (10 grams to ½ litre of water) should be used during the day, with drying powders (such as that of zinc oxide and starch, equal parts) at night until the exudation has ceased, when **Astringent Ointments** may be applied (e.g., zinc oxide 60 grams, ol. olivæ 40 grams). The regeneration of epidermis is stimulated by tar, which also allays irritation. When the epidermis is thickened, keratolytic substances should be incorporated in the ointment, especially **Salicylic Acid,** as in the famous paste of Lassar. In severer cases, salicylic plasters, containing from 10 to 50 per cent of salicylic acid, are required to produce exfoliation of diseased epidermis, or a blending with soft soap is useful, as in the following formula:—

R	Naphthol	10 grams	Vaselini	
	Sulph. Precip.	50 grams	Saponis Viridis āā	20 grams

Pastes, by reason of the starch they contain, are drying media, and may be used in wet conditions where ointments are not serviceable. Besides the well-known formula of Lassar, the following of Unna is given:—

R	Ol. Lini		Zinci Oxidi	
	Aq. Calcis	āā 30 grams	Calc. Carb. Precip. āā	20 grams

Pastes and ointments must be applied directly to the affected part and covered with gauze and a muslin bandage. In order to obviate the necessity of the covering, which is often a source of discomfort, many formulæ have been devised for a solution leaving a thin film on the surface when dry. Examples of such formulæ are:—

(1) R	Zinci Oxidi		Glycerini	50 grams
	Gelatini Alb.	āā 30 grams	Aq. Dest.	90 grams

This mass is rendered fluid over a water-bottle and painted on the area with a brush, and then powdered over, e.g., with starch.

(2) R	Bassorin (gum tragacanth) 5 parts	Glycerini	2 parts
		Water	100 parts

This is applied in a thin layer, and dries forming a protective film. Other medicaments may be conveyed in this medium, e.g., ichthyol.

Schamberg[3] makes the shrewd observation that **Arsenic** is much less often employed by specialists in dermatology than by general practitioners in the treatment of skin diseases, and indeed in only three is it of special service—psoriasis, pemphigus and dermatitis herpetiformis which are considered allied diseases, and lichen planus—and even in these the drug may often with advantage be replaced by others. The serious accidents which may happen with prolonged arsenical administration must be always carefully borne in mind. These were very completely illustrated in the epidemic of arsenical poisoning due to beer-drinking which occurred in England in 1900. One of the earliest symptoms of arsenical intoxication is heat, swelling, and pain in the hands and feet; erythematous blotches, suffusion of the face and eyes, desquamation and keratosis of the palms and soles, brownish or blackish pigmentation, are also early symptoms which may precede the more important nerve changes; and cutaneous epitheliomata may, very rarely, develop as a sequel to arsenical keratosis. This formidable list of ill consequences should influence the practitioner in the direction of withholding arsenic, except when there is special indication for it, and in warning patients not to continue indefinitely the use of medicines containing it.

References.—[1]*Ther. Gaz.* Oct. 16, 1907; [2]*Deut. med. Woch*, May 6, 1907. in *Brit. Med. Jour.* Dec. 21, 1907; [3]*Ther. Gaz.* June 15, 1908.

SKIN DISEASES (INDUSTRIAL). *E. Graham Little, M.D., F.R.C.P.*

The operation in this country of the Workmen's Compensation Act, which includes industrial diseases, has directed attention to a number of special affections, some of which are described by Shufflebotham,[1] who describes the factors to be considered in any given case as: (1) Personal idiosyncrasy; (2) Want of cleanliness; (3) Nature of the occupation. Anthrax and "bunches" (ankylostomiasis) are found in the tin mines of Cornwall. Chrome ulceration, resulting from handling bichromate of sodium and potassium used in dyeing, is a well recognized form; the earliest symptoms are "boils," "pimples," or "eczema"; the final ulcers are sluggish and painful; they occur on the mucous membrane, e.g., of the nose, as well as on the skin of the hands. Skin affections are common among aniline dyers in the form of eczema, often accompanied by blepharitis, conjunctivitis, and onychia. Rules enjoining strict personal cleanliness resulted in a considerable improvement in a factory under the author's supervision during a year's working. Workers in arsenic, much used as a colouring agent in some industries, in the form of Scheele's green, Schweinfurt green, and in wall-papers, often develop an erythematous and vesicating eruption, with ulceration in neglected cases; the hands, forearms, neck, and nostrils are chiefly affected, occasionally also the thighs, feet, and scrotum. Eczema is frequent among potters, and is due to the silicious dust, to irritating colour-reagents, and to turpentine.

Washerwoman's eczema is due to the strong alkalies or bleaching solutions used in laundry work; microbic infection may also result in these workers from handling infected clothes. Chrysoidine is used by bootmakers for colouring the soles of boots and shoes, and in jam factories for lacquering tins; this reagent produces inflammation of the skin which may proceed to ulceration. Flax spinners are subject to an irritative eczema which is ascribed to the oils in the flax. Chemical manufacturers and druggists are exposed to many irritating contacts, of which quinine is particularly mentioned by the author as being often responsible for dermatitis. Lime-juice workers and those who handle bitter oranges are subject to peculiar forms of dermatitis which, especially in the latter case, may be complicated by general toxic symptoms, headache, neuralgia, giddiness, and cramp. A very extended list of occupations which are attended by special skin affections is given by the writer, and includes: Mother-of-pearl makers, bronzers, electroplaters, matchbox makers, French-polishers, cabinet makers, glue makers, brush makers, leather dressers, tanners, curriers, furriers, plasterers, steel grinders, metal smelters, cement makers, tar workers, etc.

Tar and Asphalt Workers' Epithelioma and Chimney-sweeps' Cancer.—Sir Thomas Oliver[2] is satisfied that the irritation which produces epithelioma in soot workers is due to products of combustion of coal, not to coal itself; coal miners as a class are not especially subject to cancer. Coal-oil, produced by distilling coal and used for lubricating waggons, etc., was apparently responsible for these cases of epithelioma in a single small factory. Asphalt, a mixture of slag, tar, and boiling pitch, was the cause asserted for the development of epithelioma of the scrotum in two cases here described. Epithelioma following long exposure to soot has been repeatedly described, and seems commoner in this country than abroad, where the soot workers exercise greater personal cleanliness. Tar workers' epithelioma generally begins in the form of warts, which may exist for years without becoming malignant. The irritating effect of tar, asphalt, paraffin, coal-oil, and creosote is evidenced by the frequency of so-called tar acne or folliculitis in workers in these products who are not personally exceptionally clean.

Treatment is preventive and curative. The workmen should wear protective covering where possible, and thoroughly wash their exposed parts before leaving work. When warts have made their appearance these should be excised early; ulcers when non-malignant may be treated with **Enzymol.** Periodical examination of the men by a surgeon should be insisted upon.

Dermatitis due to Metol.—This is restricted to workers in photography, in which pursuit metol is a favourite item in developing solutions. Beers[3] has had numerous cases, although in the literature of the subject he has found only one record. The symptoms are redness, swelling, and the formation of vesicles, with subsequent exudation and desquamation of the part exposed to the irritant, combined with

intense burning and itching, and rise of temperature; the commonest situation being naturally the hands. Susceptibility apparently increases with its use. As a preventive measure, Beers recommends those who are obliged to use this reagent to dip their hands into a saturated solution of **Paraffin in Benzine** before contact, and to wash the hands well in soap and water after developing is finished. For the treatment of the acute stages of this dermatitis, rest and protection of the parts are imperative; a cathartic should be given, and the following prescription is recommended:—

R	Acid. Carbol.	gr xl-lx	Glycerini		℥ij
	Pulv. Calaminæ	℥j	Aquæ Calcis		℥j
	Pulv. Zinci Oxidi	℥ij	Aquæ Rosæ	ad	℥iv

To be shaken up well and applied on strips of lint.

In the stage of exudation, if an ointment is desired, the following formula may be useful:—

R	Hydr. Chlor. Mitis	gr x	Ung. Aquæ Rosæ	℥j
	Acid. Carbolici	gr x-xx		

When the affection has become chronic, a more stimulating application may be necessary, e.g.:—

R	Acid. Salicyl.	gr xxx	Zinci Oxidi	℥ss-j
	Pulv. Amyli	℥j-ij	Ung. Petrolati	℥j
Or,				
R	Ichthyol	℥j	Acid. Borici	gr xxx
	Acid. Salicyl.	gr xx	Ung. Zinci Oxidi	℥j

Resorcin or oil of cade may be added to either of these when desired.

Dermatitis of Cement Workers.[1]—Cement contains carbonate of lime, silica, sulphuric acid, magnesia, etc., and the maceration of the hands with water in using it adds to the injury which those agents cause. The earliest lesion produced is a small papule, which gradually enlarges; excoriation speedily follows, as the lesion is itchy, especially when the parts affected are warm, as in bed. Œdema may occur, and if the affection remains untreated, lichenification. The treatment consists in suspending the use of the irritant and in applying **Lassar's Paste** (without salicylic acid) as follows: Vaseline, lanolin, zinc oxide, starch, equal parts.

A Disease of the Skin Occurring on the Hands of Workers among Sheep.—Five cases are described with the common symptoms of painful tumour appearing on the wrists and hands of persons working amongst sheep during the summer months. One such tumour was excised and examined microscopically, the report being that there were no anthrax organisms, but the fluid exuding from the tumour contained a bacillus like that of malignant œdema. The tumour should be incised and dressed with antiseptic fomentations, the arm being kept in a sling.

References.—[1]*Brit. Med. Jour.*, Aug. 22, 1908 [2]*Ibid.*; [3]*N.Y. Med. Jour.* Sept. 12, 1908; [4]*Il Policl.* Aug. 23, 1908.

SKIN DISEASES, IONIZATION IN. *E. Graham Little, M.D., F.R.C.P.*

Lewis Jones[1] describes the principles of ionic medication in skin diseases as follows: "If two plates of copper be suspended in a beaker filled with copper sulphate solution, and a current of electricity passed through the solution between the plates, it will be found that the positive plate loses weight while the negative plate gains weight: or, in other words, copper leaves the positive plate, passes into the solution and leaves the solution again at the negative plate, and is then deposited in the metallic state." The same movement away from the positive pole takes place with zinc, iron, and other metals capable of forming soluble compounds, and also with the alkaloids. The molecules thus displaced—electrically-charged ions, as they are called—may thus be driven into the tissue on which the positive electrode is placed, and when this is the skin, may be shown to penetrate this tissue to a degree proportionate to the strength of the current and the time of application. Similarly, the negative pole electrode should be placed on the skin when it is desired to introduce into it negatively-charged ions, such as the acids, the halogens, etc., and the same rules apply to them. For all ionizations, a strength of 1 or 2 per cent solution to be electrolyzed is amply sufficient, the duration of application should vary from ten to twenty minutes, and the strength of current should be proportional to the area of the electrode used upon the skin—taking 3 ma. per square centimetre as an approximate strength. The best results have been obtained with *rodent ulcer* and *lupus erythematosus*. Hartigan[2] reports a case of healing of *trophic ulcer of the foot* by copper ions after one sitting. The use of cocaine, which can be introduced by ionization, as a preliminary measure, seems to prevent much of the pain which is a drawback to the treatment. I have personally had excellent results with zinc ionization in three cases of lupus erythematosus in which it appeared to produce a cure after single exposures of twenty minutes. I treated a flat warty growth an inch by half an inch in area, occurring on the face below the eye in a man of 48, which had persisted unchanged for twenty years, and then began to show signs of growth, with a mixture of zinc and magnesium ions; the warty growth entirely disappeared with one treatment, leaving a slightly atrophic but healthy site. I have also had very encouraging results with three cases of rodent ulcer, after X rays had failed to make much impression. The pain experienced in treatment varies greatly with different people and at different times: the method is not well adapted to nervous people or to young children.

REFERENCES.—[1]*Brit. Med. Jour.* Oct. 17, 1908; [2]*Trans. Roy. Soc. Med.* Oct. 1908; *Med. Rec.* Sept 12, 1908.

SKIN DISEASES (TROPICAL). *J. W. W. Stephens, M.D.*

A. Castellani[1] classifies and discusses the treatment of the dermatomycoses due to various species of *Tricophyton* as follows:—

1. *Tinea cruris, or Dhobie itch*, is a term confined to a skin affection characterized by bright-red festooned patches with abrupt elevated

edges, affecting the crutch and neighbouring parts. It clinically corresponds to *Eczema marginatum* of Hebra. As the result of scratching, a secondary eczematous-like dermatitis may develop. The disease may also spread to other parts of the body, forming rings or solid elevated dark patches. In these parts it may be clinically indistinguishable from *T. circinata*, but the patches of the former affection are coarser and larger than those of *T. circinata*. Occasionally, however, both affections occur together. The fungus is : (*a*) *Tricophyton cruris* (Castellani, 1905). It is easily found in fresh cases, but with great difficulty in old. The tubular mycelium is 3·5 to 4·5 μ thick; the segments are straight and often show branching. The spores are roundish, but never form clusters. In old cases the mycelium may be banana-shaped, or long strings of ovoid elements are seen. This is the fungus found by the author in 98 per cent of his cases in Ceylon ; but there also occurs : (*b*) *Tricophyton perneti*, distinguished from the former only by its cultural characters. The fungus should be sought for at the edges of the eruption.

Diagnosis.—From *Erythrasma*.—The patches are of a fawn or dark-red colour and have fine scales. The fungus in this case is quite different, viz., *Microsporoides minutissimum*. From *Intertrigo*.—The lesions are superficial, not festooned ; the edges are not raised. There is no fungus. From *Eczema*.—The moist surface and the absence of other characters serve to distinguish this very common affection.

Treatment.—In mild cases, a **Resorcin-Salicylic Ointment** is applied twice daily. In medium cases, **Chrysarobin Ointment,** or if more severe, **Turpentine Oil** locally in the morning, and at night resorcin-salicylic ointment ; or if there is much inflammation, **Boracic Ointment** at night. Turpentine is not always borne well. In *severe cases*, **Resorcin** dissolved in **Tinct. Benzoin. Co.** applied once daily for several days. The skin peels off and the eruption is generally healed. The application is very sticky. If fissures are present in the groin, they are touched with silver nitrate solution ; the resulting pain soon disappears, and the itching is relieved almost at once. At night resorcin-salicylic ointment is applied, and when the parts are less moist, turpentine or the resorcin-benzoin treatment is adopted. During and after treatment the underclothes should be dusted with an antiseptic powder, e.g., boracic acid and zinc oxide, and salicylic and talc, menthol powder, or dermatol.

Manson treats cases of *Tinea cruris* with **Vleminckx's Solution** (sulphuret of calcium), one part to three parts of water. This is applied on the first night and washed off next morning; the second night half strength solution, washed off next morning; and the third night full strength solution, and this is allowed to dry on. The itching stops, and very often the eruption completely disappears.

2. *Tinea albigena* generally is an affection of the soles of the feet and palms of the hands. It is common in the Malay Archipelago, Siam, etc. Small pruriginous spots appear, developing into large vesicles, which burst. Diffuse keratosis develops, the palms and soles becoming

double their usual size, deep fissures forming at the natural folds. Finally, white patches develop, extending to the legs and arms. The fungus is *Tricophyton albicans*, a fungus of the megalosporon type. The spores are seldom found in scrapings. The mycelium is straight —often dichotomous.

TREATMENT.—**Tinct. Iodine** and **Chrysarobin** Ointment, 1 to 5 per cent.

3. *Tinea sabouraudi* occurs in Indo-China, Japan, Ceylon. Erythematous patches with branny scales break out on the legs. The diameter of the patches is 1 to 1½ in. The circination of the patches is incomplete—½–⅔ of a circle. The base of the patches is of a very dark bistre-brown colour. In chronic cases the edges may show licheniform thickening. The fungus is *Trichophyton sabouraudi*. The mycelium is not very straight, has no double contour, and is often banana-shaped. The segments of the mycelium are all separate. The spores do not form a string.

TREATMENT is difficult. **Chrysarobin** ointment (1–4 per cent) is best.

4. *Tinea imbricata* occurs in Fiji, China, Malayia, India, Ceylon, Brazil. Its characters are well known. The fungus, *Trichophyton concentricum*, is abundant in the scales, occurring as a diffuse interlacing mycelium. The mycelium is generally straight and regular, 3 to 4 μ broad. The spores are 4 to 5 μ, oval or rectangular.

TREATMENT.—Either strong liniment of **Iodine**, or 30 to 80 gr. resorcin to the ounce of tinct. benzoin. co. The **Resorcin-Benzoin** is to be applied once or twice daily, and is continued for some weeks. Once or twice a week the patient is given a hot bath and scrubbed with sand soap.

5. *Tinea intersecta*.—He has seen several cases of this affection, first described by himself, in Ceylon. It begins as a slightly-raised patch on the limbs or trunk. At the margin of the patches there are minute dark papules. The patches, at first smooth and tense, later become wrinkled, and cracks appear in the form of white lines, or later, clefts. Flaky curled scales are given off. The eruption is not concentric, but the patches fuse. The fungus is a *Trichophyton*, occurring on the inner, but not on the outer, surface of the scales. Spores are very rare. The mycelium consists of long articulated segments.

DIAGNOSIS.—From *Pityriasis versicolor*. In this the epidermis does not split, and the fungus is superficial, not between the superficial and deep layers of the epidermis.

TREATMENT.—**Tincture of Iodine** and the usual antiseptic ointments.

6. *Tinea rosea*.—Common in Europeans. Occurring on the chest, axilla, and back. The eruption forms pinkish patches, not scaly, and there is no pruritus. The fungus is a *Malassezia*. The mycelium is thick, irregular, and constricted. The spores are 4 to 6 μ, in clusters.

DIAGNOSIS.—The fungus distinguishes it from *Seborrhœa corporis* and *Pityriasis rosea*.

TREATMENT.—**Tinct. Iodine** or **Salicylic Alcohol** lotion 2 to 4 per cent, or **Resorcin** (10 per cent), **Salicylic** (2 per cent) ointment, easily cure the affection.

REFERENCE.—[1]*Trans. Soc. Trop. Med. and Hyg.* 1907–8.

SKIN GRAFTING. *Priestley Leech, M.D., F.R.C.S.*

Archibald Young[1] describes a modification of the Wolfe-Krause (whole thickness of skin) method which has given him good results in all kinds of cases. The procedure is as follows: The skin is removed by cutting with a knife down to the aponeurotic covering of the muscles, and the graft is immediately placed in warm saline or borax solution. The fresh wound is forthwith completely closed by suture and dressed aseptically. Every detail of asepsis must be observed, not only at the operation but at the preliminary preparation of the skin of the part from which the flap is to be taken. Any attempt to remove the skin graft and leave the fat lengthens the procedure and is of no advantage. The surface to be grafted is then uncovered, and if the surface is an aseptic one, the only preliminary to the application of the graft or grafts is the thorough checking of hæmorrhage. If asepsis is not practicable, as after a burn, the granulating surface is gently irrigated with sterile saline or borax solution, discharge is carefully removed, and the surface dried with sterile gauze. Any antiseptic employed must be followed by abundance of saline solution; strong antiseptics must not in any circumstances be employed. Before grafting is decided on for any granulating wound the surface must be brought into a healthy state. All necrotic tissue and exuberant granulations should be removed some days before. The surface should be level and of a healthy rose-pink colour. The edges should be smooth and clear of dried discharge and epithelial débris. It is unnecessary, and probably even a disadvantage, to remove the superficial layers of a granulating surface before applying the graft or grafts. The flap of skin and fat is taken from the warm solution into which it was put immediately on removal, and the fat is removed by turning the flap over on the palm of one hand and cutting it away with scissors curved on the flat. If only a small surface is to be covered, this may be done without division of the flap, but if the surface is an extensive one the flap may be divided up into as large a number of pieces as the surgeon thinks desirable, these being distributed over it at suitable intervals.

After application of the grafts, the whole surface is covered with some protective material, either oiled silk, or guttapercha tissue, suitably perforated, or the "protective gauze tissue" prepared by McMillan, of Glasgow. This protective tissue need not be interfered with for several days, but the overlying dressing must be changed daily. The best external dressing is a moist one. Plain, smooth, aseptic gauze soaked with sterile saline or borax solution (not boracic acid, which to some patients is too irritating) is most satisfactory. It should be applied in liberal quantity, and should be covered with a sheet of guttapercha or other waterproof tissue, so as to preserve the "moist" character of the dressing. The whole is then supported lightly, firmly, and equally with wool and bandages, and the part placed at rest in a comfortable position.

REFERENCE.—[1]*Glasg. Med. Jour.* Oct. 1908.

SLEEPING SICKNESS. (*See* TRYPANOSOMIASIS.)

SLING FOR FOREARM. *Priestley Leech, M.D., F.R.C.S.*

Wermuth[1] describes a very useful sling for the forearm which avoids the trouble of the usual bandaging and plaster-of-Paris for injuries, etc. of the clavicle, shoulder, and arm. The sling is made of strong muslin

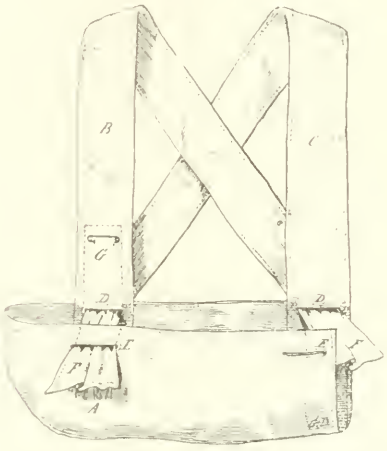

Fig. 92.—The Trough Suspender Forearm Sling.

Fig. 93.—Anterior view of arm sling applied to a case of football fracture of the clavicle and Colles' fracture of the wrist. Shows easy riding sling; simple compress pad over site of fracture of clavicle.

Fig. 94.—Posterior view of arm sling. Shows easy and firm purchase of both trough and suspender pieces.

cloth. The trough is formed out of a square piece of the cloth 18 by 18-in., folded over, and one end sewn up as *A* in *Fig.* 92: the edges are reinforced by a 1-in. hem. To this trough-piece are sewn two suspensory slings (*B and C*, *Fig.* 92) each 42-in. long and $3\frac{1}{2}$-in. wide

at the proximal end, where they are stitched to the upper margin of the inner or body wall of the trough piece. These pieces, forming the suspensory slings, taper to a 2½-in.-wide distal end (*F*); their attachments are reinforced by an inch hem. Through this strengthened attachment on each side a button-hole (*D*) opening is made, large enough to pass the distal extremity of the suspensory sling through. In the upper margin of the outer wall of the body-piece two button-holes (*E*) are made directly opposite the former two to receive these distal ends. The distal ends (*F*) pass through the button-holes of the walls of the trough-piece, and, drawn taut as occasion demands, securely lock and fix the arm sling. The illustrations show the method of application.

REFERENCE.—[1]*Ann. Surg.* Feb. 1908.

SMALL-POX. (*See* VARIOLA.)

SNAKE-BITE. *J. W. W. Stephens, M.D.*

C. S. Braddock[1] describes the treatment of snake-bite in the jungle. He states that an important distinction between the bite of a poisonous and a non-poisonous snake is that the former leaves only the two punctures of the poison-fangs, while the less poisonous and harmless snakes leave, besides the two punctures, the marks of the adventitious teeth. The treatment is to cut deep into the tissue, causing free bleeding. Put a tourniquet between the bite and the trunk of the body, and keep it on tightly for at least an hour. Rub in crystals of **Permanganate of Potash,** and pack the wound with the same. Strong permanganate is also injected with a hypodermic syringe in a series of punctures all round the wound at a distance of an inch or so, to counteract any partly absorbed poison. **Nitroglycerin** and **Digitalis** are given in heroic doses, **Brandy** and **Whisky** in half-pint doses, and **Strychnine** hypodermically in large doses. Such treatment was in the author's hands very successful in Siam.

C. W. B. Crum[2] recommends the following treatment for the bite of the copperhead (*Ancostrodon contortrix*):—Local anæsthesia with ethyl chloride; then two parallel incisions an inch long are made, one through each fang puncture. The wound is washed out with concentrated **Potassium Permanganate Solution,** and compresses of this solution are applied, to be renewed every half hour. Internally, strychnine, alcohol, and ammonia are given. The patients recover in a few hours.

REFERENCES.—[1]*N. Y. Med. Jour.* Nov. 9, 1907; [2]*Jour. Amer. Med. Assoc.* May 12, 1906, in *Arch. f. Schiffs. u. Trop. Hyg.* 1908, p. 304.

SPASMUS NUTANS.

(*Vol* 1907, p. 504)—Still recommends **Open-air** treatment and **Cold Douches**; in some cases a combination of **Cod-liver Oil** with **Bromide** is useful. **Phenazone** (gr. ss per dose for a six-months child, gr. j per dose for a year-old child) is on the whole more valuable than bromide.

SPERMATORRHŒA.

(*Vol.* 1894, p. 515)—**Cold Sitz Baths,** at 50° to 70° F. for five to twenty minutes daily at bedtime, are recommended. **Cimicifuga,** 10 to 30 drops after meals, has been given usefully; also the following pill at bedtime: Ext. Aloes gr. ¼, Ext. Belladonnæ gr. ⅙, Ext. Hyoscyami gr. ¼, Pulv. Camphoræ gr. ¼.

SPINA BIFIDA.

(*Vol.* 1903, p. 613)—**Excision** is a safer method of treatment than injection, in properly selected cases. Operation is contraindicated by (1) Other congenital defects (talipes, hydrocephalus); (2) Paralysis below the level of the cord defect; (3) Sloughing of the skin over the sac.

SPINAL ANALGESIA. (*See* ANÆSTHESIA.)

SPINAL CARIES. *Priestley Leech, M.D., F.R.C.S.*

Prof. Estor,[1] of Montpellier, says that since the days of Bonnet the treatment of Pott's disease has not progressed in any notable degree; the principles have remained the same. The general lines of treatment now accepted by the majority of surgeons are as follows: (1) Forcible straightening as recommended by Calot has been completely abandoned. (2) At the beginning and during the course of the disease, the dorsal decubitus must be maintained. (3) Jackets and corsets which allow the patient to walk should only be employed during convalescence. (4) By the immobilization in the dorsal position the formation of gibbosities is prevented and the disappearance of recent gibbosities is obtained. (5) Old gibbosities are incurable. (6) The treatment of Pott's disease is necessarily very long-continued, and immobilization in the dorsal position ought to be maintained for at least two years. For the last twelve years Estor has employed Bonnet's apparatus with the best results. In dorsal and lumbar disease, care must be taken that a hollow is not produced in the mattress and curvature of the spine result; this is prevented by padding the mattress slightly at the seat of the disease and thus producing a slight convexity to press against the spine. Another advantage of Bonnet's gutter is that it can be placed on a carriage and the patient taken out of doors. The illustrations explain themselves.

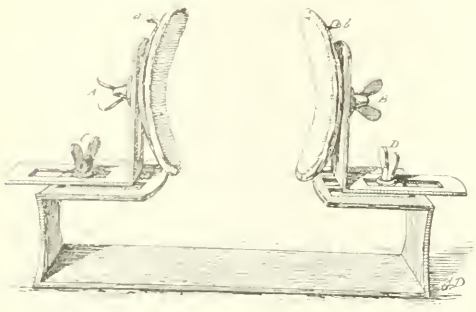

Fig. 95.—Apparatus to ensure immobility of the head in the treatment of Pott's disease (superior dorsal or cervical).

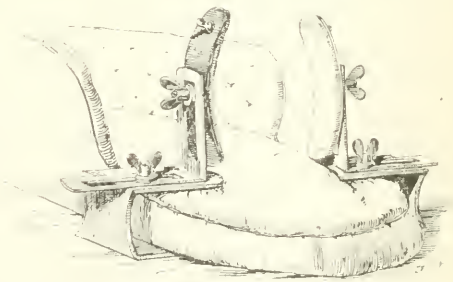

Fig. 96.—The apparatus adapted to Bonnet's gutter.

REFERENCE.—[1]*Sem. Méd.* June 24, 1908.

SPINAL COLUMN AND CORD, SURGERY OF.

K. W. Monsarrat, F.R.C.S.

Donald J. Armour,[1] in his Hunterian Lectures, reviews the whole subject of the surgery of the spinal cord. Some of his more important points may be summarized as follows:—

Spina Bifida.—The only forms of treatment to be recommended are palliation or excision. Simple meningoceles, which are best suited for the previously much-used injection (Morton's fluid), are just those in which the more radical operation of excision is clearly indicated. Nerves which end in the sac of a myelomeningocele should be excised. For closing large defects, Bayer's method is to be recommended; that is to say, the dissection up of two flaps from the erectores spinæ, which are folded over towards the middle line and sutured. The most recent statistics are those of Boettcher from the Breslau clinic: 39 cases were operated on, 13 died immediately from the operation; 12 died soon after, 10 from intercurrent maladies and 2 from lesions probably associated with the spina bifida; 14 were definitely cured.

Fracture-dislocation of the Spine.—In one-third of the lesions affecting the vertebral column the spinal cord escapes all injury. This freedom from injury is seen most frequently in the cervical region. Neurologically considered, the majority of cases of injury to the spinal cord from fracture-dislocations are either of the cervical type, which includes the first dorsal segment, or the lumbo-sacral type, including the cauda equina. Surgical statistics show the latter to be much the more frequent. Clinical and experimental evidence at present goes to show that function regeneration of completely interrupted fibres of the central nervous system can only occur, if at all, with extreme rarity. In considering the advisability of operation, the questions that arise are, Will any benefit to the patient result from it? Will his life be endangered by the operation? Will he be made worse by it? The last two questions may at once be answered in the negative, provided the operation is done by a competent surgeon. By operation it is possible to relieve pressure from displaced fragments of bone, from hæmorrhage, or from œdema, and to remove the future danger of pressure from exudate and inflammatory thickening. There are probably no symptoms by which we can in a reasonable time determine beyond a doubt the presence of a complete transverse section of the cord. If this is so, the patient ought to be given the benefit of the doubt.

Tumours involving the Spinal Cord.—In vertebral tumours diagnosis is as a rule easy; definite symptoms in relation to the vertebral column are usually present; if they are absent the diagnosis is made from signs of compression of the nerve roots and cord. Surgical measures must be avoided in carcinoma, and in a measure in sarcoma, except that section of a number of the posterior roots is sometimes indicated for the relief of pain. Echinococcus cysts may be removed by operation, and gummata by antisyphilitic treatment. Exostosis may possibly come to a standstill or may be removed by operation.

Intravertebral tumours may be extradural or intradural. Extradural tumours are often metastatic, intradural mostly primary. Children are more liable to tuberculous tumours than any other, glioma being the next in frequency. From 40 to 60 years is the age of comparatively benign, slow-growing, isolated tumours of good operative prognosis. On the whole it may be said that the older the individual the more favourable the prognosis. Extramedullary tumours were four times as frequent as the intramedullary in a series of fifty-seven cases from the records of the National Hospital for the Paralyzed and Epileptic. The following table shows the most frequent forms of tumour found in various parts of the cord, according to this series:—

Region	Intramedullary	Extramedullary
Cervical	Tubercle, glioma	Sarcoma, fibrosarcoma, endothelioma
Dorsal	Tubercle, sarcoma	Sarcoma, endothelioma, echinococcus, fibrosarcoma, fibromyxosarcoma, fibromyxoma
Lumbar	Gumma, sarcoma	Sarcoma, echinococcus
Cauda Equina	—	Fibromyxosarcoma, lymphangioma, angioma, cylindroma

William G. Spiller[2] reports on nine cases of *Tumour of the Cauda Equina and Lower Vertebræ*, seven with necropsy, three with operation. The prognosis of operation for tumour at the lower part of the vertebra column is not good at present, judging from the published cases. Of the cases submitted to operation, the first was a fibrosarcoma in a woman about 50. It was removed piecemeal from within the dura. Intense pain in the lower limbs was complained of for a day or two after the operation, and the weakness of these limbs increased. By the fifth day the pain was much less, and there was some improvement in motion. She died on the fifteenth day; the cause of death is not stated, but it was not infection. The second case was also a fibrosarcoma, in a man aged 55, who gave a history of accident, though not definitely involving the spine, some two years previously. The tumour was not found at the operation. The patient died two days later from pulmonary œdema. At the necropsy the tumour was found on the anterior part of the spinal dura; it appeared to have originated in the bodies of the third and fourth lumbar vertebræ. The third case was that of a woman presenting a round-celled sarcoma within the dura implicating the roots of the cauda equina. Hæmorrhage was profuse, and the operation was abandoned; death occurred three hours later.

R. C. Elsworth[3] writes of a case of tumour of the cauda equina, "fibromuscular" in structure, removed successfully. The patient

was a woman aged 45, who complained of what she called sciatica in both legs, of four years' duration, during the last two of which it had been of such severity that she could not carry on her household duties. She had had a great variety of remedies, including stretching of the sciatic nerves. There was wasting of the glutei maximi and all the muscles supplied by the great sciatic. A diagnosis of tumour in the spinal canal at the level of the fifth lumbar vertebra was made. The tumour was found within the theca; it was encapsuled and easily shelled out. After the operation the pains gradually disappeared, and the muscles of the lower limbs regained their normal bulk and function.

Warrington and Monsarrat[1] report a case of *Paraplegia due to an Intramedullary Lesion* treated with some success by operation. The patient was completely paraplegic; four years previously he had fallen on to the lower part of his spine; this was followed by pain in the lower limbs and trunk for two years. A slight and slow weakness of the legs then developed; but he recovered from this, only to become suddenly paralyzed in the right leg, the left following suit later. At the operation the posterior columns of the cord at and below the seventh dorsal level were found transformed into a brownish-grey gelatinous material, from which a clear yellow fluid came on incision. After the operation the patient made considerable progress towards regaining the use of his limbs. The case was probably one of cavity in the cord, either gliomatous or due to hæmorrhage. The sudden onset of paralysis is to be ascribed to hæmorrhage into this cavity.

Injuries to the Spine.—At the Congress of the International Society of Surgery, Professor de Quervain presented an important report on injuries to the spine. This may be summarized under the following headings: (1) There is no clinical picture corresponding to simple spinal commotion, i.e., purely functional troubles without anatomical lesion. (2) Our present knowledge as regards diagnosis enables us in most cases to distinguish with certainty between a partial and a complete lesion, although some cases of partial lesion present the symptoms of complete lesions during the first hours or even days. (3) If the tendon reflexes are present it is practically certain that there is not a total lesion; on the other hand, absence of these reflexes is no proof of a total lesion unless the absence persists. (4) Symptoms and signs do not allow us to distinguish between spinal contusion and spinal compression. (5) There is no evidence, except the isolated case reported by Stewart, of the possibility of regeneration of spinal cord fibres. (6) Neither extradural hæmorrhage nor intradural hæmatoma indicate the necessity for operation as a rule. Only when the symptoms persist should the late operation be undertaken. (7) Operation should be done when the signs point to hæmatomyelia. Early operation is necessary when the symptoms and signs are to be attributed to fracture of a vertebral arch; or, in injury from firearms, when the projectile is in the vertebral canal. (8) Early operation may be useful in cases of dislocation when bloodless reduction has

failed and the patient presents the symptoms of a partial lesion. (9) Late operation is called for if, in cases falling into classes 7 and 8, the symptoms have not made progress towards recovery; also if a case of partial lesion shows signs of extending. (10) As to operation in total lesions, if the result reported by Stewart should be confirmed, the indications for operation will of course be extended.

Professor de Quervain analyzed 218 cases of operation as follows:—

Cured.—13·8 per cent; 10 per cent definitely influenced by operation.
Improved.—22 per cent; 16 per cent definitely improved by the operation.
Unimproved.—37·2 per cent.
Made worse by operation.—1·8 per cent.
Died soon after operation.—25·2 per cent.

At the same Congress, Professor Berard, of Leipzig, reported on *Tumours of the Spine*. The results obtained enabled the following rules to be laid down. Any patient presenting a clinical picture possibly dependent on a spinal tumour should be submitted as soon as possible to the joint investigation of a physician and a surgeon. Immediate operation should be undertaken if the diagnosis is primary isolated tumour, even if the symptoms have not gone beyond the period of pressure on the roots. A large exploratory laminectomy is better than waiting for the signs of segment compression of the cord. Operation should be performed in one stage. Tumours associated with deformities of the spine offer no promise of operative success. Tumours giving signs of a medullary situation are only to be operated on when the localization signs are precise and limited. In cases where it is difficult to decide between tumour and lesions of limited chronic meningitis or myelitis, exploratory laminectomy is indicated. Some cystic collections due to localized meningitis have been greatly relieved or cured by operation. In cases of myelitis and syringomyelia nothing can be lost by operation, and in tumour it offers the only chance of cure.

Baer[5] relates three cases showing how *obscure and crippling pains* may arise from deformities of the spinal column, congenital and acquired. Radiography now permits of the diagnosis of such lesions and their relief. The discovery and removal of a cervical rib has relieved several cases of inveterate brachial neuralgia. Extra ribs are not confined to the cervical region. In one of the cases a rudimentary rib sprang from the left side of the fifth lumbar vertebra. It passed down into the pelvis and was intimately bound to the lumbo-sacral cord, and was the cause of a sciatica which had rendered the patient an invalid for five years. It was removed, with complete recovery. A second case presented a large exostosis an inch and a half in length, extending from the lower border of the third lumbar vertebra, impinging on the side of the fourth lumbar vertebra, and causing intense pain in the lumbar region. The patient had had gonorrhœa twenty years previously. The exostosis was removed, with complete relief from symptoms. In the third case there was a definite

gonococcus intoxication, the cause of the formation of an exostosis on the inferior aspect of the os calcis and two spinal exostoses, one springing from the lower border of the third lumbar vertebra and the other from the upper border of the fourth. There was pain on lateral movement of the spine ; as long as the patient wore a support which prevented lateral movement in the lumbar region he was perfectly comfortable. These cases are worthy of particular notice, and indicate the necessity for radiographic examination in all cases of pain on spinal movement.

References.—[1]*Lancet*, 1908, pp. 693, 765, 838 ; [2]*Amer. Jour. Med. Sci.* Mar. 1908 ; [3]*Ann. Surg.* Oct. 1907 ; [4]*Lancet*, Jan. 11, 1908 ; [5]*Ann. Surg.* Nov. 1907.

SPLEEN, SURGERY OF. *Rutherford Morison, F.R.C.S.*

Splenectomy for injuries of the spleen is now an established operation, for many successful cases have been recorded. So far as is at present known, nothing untoward has followed removal of the spleen, but a careful detailed record of cases operated upon some years ago is still required to refute or establish the belief that compensation for the loss of the spleen is perfectly acquired. The diagnosis of ruptured spleen is based upon the history of injury, possible marks of its site over the spleen, and the signs of a serious abdominal lesion, plus those of intra-abdominal hæmorrhage. If the laceration in the first instance has not torn the spleen capsule, a subcapsular and limited but slowly increasing hæmorrhage may occur. When this bursts through the capsule free hæmorrhage follows, so that in such instances the signs of free bleeding may not occur for several hours after the accident. Abdominal pain, rigidity and tenderness of the muscles and parietes of the abdominal wall, marked pallor, and increasing rapidity of the pulse are the chief signs upon which a diagnosis has to be based. In many cases it has been noted that coagulation of the escaping blood around the spleen has caused increased dullness in the left hypochondrium, and this sign has led to a correct guess that the spleen was torn and bleeding. In the presence of such symptoms immediate operation is demanded. The operation which in the past has given the best results in laceration of the spleen has been excision, but this should not be undertaken unless the spleen is too badly damaged to recover, or the bleeding cannot otherwise be arrested. Careful and skilful use of catgut sutures and gauze packing should arrest any ordinary hæmorrhage, but if doubt is felt that this has been fully accomplished the spleen should be excised. In one of the reported cases the injury was due to gunshot, in the other to more ordinary injury—a run-over producing laceration.

Arthur H. Bogart[1] records a case of traumatic laceration of the spleen where blood transfusion was performed prior to splenectomy. Death occurred three and a half hours later, and the post-mortem examination revealed a large retroperitoneal hæmorrhage due to several small lacerations of the liver and to a torn renal vein.

Edwin H. Fiske[2] performed splenectomy through a T-shaped incision for a gunshot wound of the spleen. The bullet had entered the upper pole, and after ploughing up an increasingly wider area of splenic tissue, emerged from the lower pole; it was subsequently located in the pelvis by the X rays. The spleen was excised, and the patient made a good recovery.

Apart from enlargements due to an increase of one or the other or all of the constituents of the spleen, diseases of it are rare. Malignant growths necessitate splenectomy, and are very rare indeed. Mary A. Smith[3] records a case of colloid carcinoma with subsequent secondary deposits in the spleen, and where splenectomy was performed. Nearly ten years before (and about two years after a parturition) double oophorectomy and appendicectomy were performed for a papillomatous growth undergoing colloid degeneration, the whole peritoneum being involved. At the splenectomy operation, except that the transverse colon and a loop of small intestine were adherent to the tumour, the other abdominal organs were normal. Death occurred seven months after removal of the cancerous spleen from peritoneal recurrence, and was probably secondary to the double ovariotomy.

Splenic enlargement is due to a variety of causes as yet mostly ill understood. Banti has described the associations of one of this group, and if, in addition to having enlargement of the spleen, the patient is pigmented, emaciated, anæmic, subject to hæmorrhages, and has not the characteristic blood changes of splenomedullary leukæmia, he is said to be suffering from Banti's disease. The prognosis of cases left alone is most unfavourable. Cirrhosis of the liver and ascites develop, and death follows. Splenectomy in this condition has been followed by cure in so many recorded cases, that considering the inevitably fatal termination under every other form of treatment, though its rationale is at present inexplicable, this operation should meanwhile be regarded as the proper course to suggest.

Torrance[4] gives a résumé of all the recorded cases where splenectomy has been performed for Banti's disease, with a case of his own in which there was a twelve months' history of digestive trouble, headache, pain in the back and left side, and muscular weakness. The spleen and liver were enlarged, the latter only slightly; the skin was pigmented, and there was a deficiency in the hæmoglobin. After the splenectomy the patient was given spleen extract after meals for several weeks: seven months later she was perfectly well, had gained weight, and her bronzed skin had become normal.

There is a 25 per cent mortality with the thirty-six cases recorded. The difficulty in successfully ligaturing the large splenic veins is emphasized by the fact that nearly one half of the number of fatal cases was due to hæmorrhage at or immediately after the operation.

References.—[1]*Ann. Surg.* Jan. 1908; [2]*Ibid.*; [3]*Ibid.*; [4]*Ibid.*

SPRING CATARRH. (*See* Conjunctiva.)

SPRUE. *J. W. W. Stephens, M.D.*

C. Begg[1] advocates **Yellow Santonin** in the treatment of sprue, but admits that a certain number of cases relapse owing to the occurrence of complications. The most common of these, and one from which few chronic cases escape, is pancreatitis. (Advanced cases of pancreatitis, it should be noted, closely resemble sprue in the following features: the passage of large, bulky, colourless, acid motions, great, often rapid emaciation, distended abdomen, anæmia, and tongue symptoms.)

The following features should be noted with a view to diagnosis: (1) In active sprue, liver dullness is diminished, except where the gall-duct is involved, and in such cases there would probably be tenderness to pressure, and some jaundice; (2) In sprue the doughy feeling and bulk of intestine, with clear flatulent note differs from the hyperflatulent resonance of a distended abdomen; (3) Aphthous patches or ulcers caused by rough teeth are not the form seen in sprue; (4) A history of attacks of fever is absent in sprue; (5) There is the evidence to be drawn from analyses of the fæces and urine (Cammidge's pancreatic reaction*). The second most frequent complication in sprue is chronic appendicitis; the third is involvement of liver and gall-bladder.

B. Bramwell and R. Muir[2] describe two cases of sprue in which muscular atrophy was well marked, changes in the muscles, consisting of great proliferation of the nuclei of the sarcolemma, resulting in some places in complete absorption of the muscle fibres by the enlarged nuclei.

Treatment.—Cantlie produced good results from **Ipecacuanha sine Emetine.** It should be given for at least four days—20 gr. the first and second days, 15 gr. on the third and fourth. If ordinary ipecacuanha is used it is well to give 15 to 20 min. of tincture of opium a quarter of an hour beforehand. As regards diet, milk is useless and detrimental. Beef, minced or pounded and lightly cooked, should form the staple diet. Eggs, five or six a day, are most beneficial. Chicken-liver soup, jellies, barley-water, are all useful; then, as the patient improves, stewed celery, seakale, or vegetable marrow. If patient is very weak, food should be given every one to three hours, according to strength, and if *in extremis*, beef-juice, beef-jelly, or beef-tea every fifteen to thirty minutes. In sprue patients the diet should be a liberal one.

References.—[1]*Brit. Med. Jour.* Nov. 9, 1907; [2]*Scot. Med. and Surg. Jour.* Oct. 1907.

SQUINT. (*See* Eye, Diagnostic Methods.)

STAMMERING.

(*Vol.* 1908, p. 512)—Cathcart in a special article lays down the following principles of treatment: Attend to the general health. Remove sources of peripheral irritation, adenoids, dental caries, phimosis, etc. Special vocal treatment should begin early to be successful. Punishments and special classes are alike to be condemned. The type of inspiration to be practised is that which by use of the ordinary muscles of

* For pancreatic reaction of Cammidge, *vide Brit. Med. Jour.* Oct. 28, 1905.

respiration without abnormal depression of the diaphragm fills the upper as well as the lower chest. By this means a steady control of expiration can be arrived at. In a few cases, the patient cannot speak the initial vowel; such patients must be told to preface initial vowels with an aspirate (e.g., "ant" is to be pronounced "h-ant") until confidence is gained, when the aspirate can be dropped. More often the difficulty is in articulation of consonants. In such cases, when the patient has learnt to hold his breath 25 seconds, let him intone the vowel-sound "ah" or "oh" for that period, at the lowest comfortable pitch. Then he should add voice consonants and learn to intone these, "o-bo-bo," etc. After these the breath consonants may be learnt in the same way. Ordinary conversation is to be attained by a gradual dropping of the intonation to a drawl. Reading aloud and recitation, in an ordinary tone, is to be practised daily. Lessons should be given twice daily, half an hour at a time, for several weeks.

STOMACH, ACUTE DILATATION OF. *Rutherford Morison, F.R.C.S.*

Acute dilatation of the stomach has been recognized and written about for several years, but no definite knowledge has been arrived at as to its causation. Every surgeon who has a large experience of stomach surgery must have observed that the duodenum too is not infrequently dilated to such an extent as to excite surprise, though no satisfactory explanation can at present be advanced, and in these cases the jejunum is usually small and contracted, offering a marked contrast to the distended duodenum above. There can be no doubt that moderate degrees of acute dilatation of the stomach are common after operations, especially abdominal ones, and it is of interest in this connection to note that Röntgen-ray examination after a bismuth meal shows that handling of the stomach or intestines prevents food leaving the stomach for several hours. The majority recover after free vomiting or after the use of a stomach tube.

At post-mortem examinations made on patients who have died after extensive injuries from "shock" and fractured spine, acute dilatation of the stomach is so frequently observed that it may almost be regarded as one of the accompaniments of "shock," and possibly one cause of it. The dilatation may cease at the pylorus or any part of the duodenum, or even extend into the jejunum, but in the majority of cases the dilatation ends at the portion of duodenum crossed by the superior mesenteric vessels. This fact has suggested a mechanical causation, and it has been assumed by certain authorities that constriction of the duodenum by the tight mesenteric vessels is the only cause of acute dilatation of the stomach, "but (though) in the majority of cases the dilatation ends at the mesentery, this does not prove that the mesentery is the etiological factor in the obstruction" (Bloodgood).

More work requires to be done in the post-mortem room and operating theatre before the etiology can be satisfactorily discussed. Meanwhile it is of great importance to note at post-mortem examinations the condition of the duodenum and of the upper part of the jejunum in these cases. After every abdominal operation when sickness is troublesome, this condition should be borne in mind and the importance of lavage remembered. It seems probable that thorough washing of the stomach, frequently repeated, and change in position, will reduce the mortality of this serious condition to a very small figure.

Frederick Thoma[1] discusses acute post-operative dilatation and its connection with arteriomesenteric closing of the duodenum. Until quite recently the mortality of post-operative dilatation of the stomach amounted to no less than 80 per cent. In a case of his own, after laparotomy for an ovarian cyst the size of a fist, and a hæmatocele the size of a fœtal head, on the third and sixth day there was continual profuse vomiting. In this, as in similar cases, the vomited matter was bile-stained, often mixed with black spots, but not feculent. The quantity vomited was in excess of the food taken. The epigastrium was swollen though the abdomen was flat, and the patient looked very ill (facies Hippocratica). In such a case abdominal section shows the stomach enormously dilated, lying on the intestines like a huge, flabby bag, and the duodenum distended to the duodeno-jejunal junction. The largely distended stomach pushes the intestines into the pelvis and keeps them there, stretching the root of the mesentery, which occludes the duodenum like a cord passing over it.

The simple but life-saving treatment is to wash out the stomach, excluding all nourishment by the mouth, and if this does not succeed, turning the patient on to the abdomen or on to the side. In the author's case, after thorough frequent stomach lavage, nutrient enemata, and subcutaneous infusion of normal saline, recovery occurred. This has happened in all cases treated by this method. The condition depends upon disturbed stomach innervation, the result of a variety of causes.

W. B. Laffer[2] writes on acute dilatation of the stomach and arteriomesenteric ileus. Rokitansky, as far back as 1842, in speaking of intestinal incarceration due to pressure of one part of the intestine or its mesentery on another, so as to compress it against the posterior abdominal wall, says, "Herewith belongs the compression of the lower transverse section of the duodenum by the mesentery of the small intestine, and especially by the superior mesenteric artery and nerves contained in the root of the mesentery." The author has collected 217 cases, including four of his own.

There can be little doubt that in the gastromesenteric type of ileus the kinking or compression of the duodenum from the weight of the prolapsed intestine pulling on the root of the mesentery and thus pinching the duodenum against the spine, is a pronounced secondary factor in keeping up the dilatation. Whether a muscular or nervous derangement of the stomach occurs first and the dilatation forces the intestine down, or the intestine is prolapsed first, we do not know. It has been found experimentally that a two-kilogram weight exerted enough pull on the mesentery to compress and close the duodenum against considerable water pressure. It seems probable that some special feature is needful in the mesentery. A partial twist, unusual length and relaxation, a partially closed fan-shaped insertion to the right instead of to the left of the median line, and absence of fat, have been offered in explanation. Ptosis of the viscera would also aid it, and as the intestine is emptied by purgation and

fasting previous to operation this would help its descent into the pelvis. In only twenty-seven of 120 cases on which post-mortem examinations were held, was the stomach dilatation of gastro-mesenteric ileus type. It seems likely, where the small intestine is found in the pelvis, and the duodenum obstructed, that these events are secondary to the stomach dilatation.

The stomach has been inflated through a gastrostomy opening in dogs. Normal conscious dogs promptly expelled the stomach contents. In deeply narcotized dogs the pressure may be increased to rupture of the abdomen. On awakening, these dogs expelled the stomach contents. After cutting the vagi, a certain amount of motor and secretory paralysis of the stomach occurs.

After the administration of an anæsthetic, it may be assumed that the vomiting centre becomes normal in most cases, but that in others a condition of lessened excitability or exhaustion, or even paralysis, ensues. It is when this last condition occurs that acute dilatation of the stomach results.

There is much evidence that innervation disturbance is the chief factor. Following hysterectomy it may be reflex. After the application of a plaster jacket and a hearty meal, it may be due to a slight injury to the cord. Associated with peritonitis, it is probably, when local, due to the effect of inflammation on the gastro-intestinal nerves, or when accompanied by general intestinal paralysis, to toxins acting on the centre or nerves. After kidney operations, it may be due to injury of the solar plexus or its branches.

Experiments on dogs have shown:—that division of the vagi produces acute dilatation of the stomach: that after successful gastro-enterostomy, division of the vagi leads to acute dilatation; that examination with the X rays after a bismuth meal shows that any interference with the stomach, such as operative manipulations, interferes with stomach peristalsis to such an extent that food will not leave it for at least three hours after. "Clinical, pathological, and experimental data are strongly in favour of acute dilatation of the stomach, as being primarily an innervation disturbance affecting either the centres in the brain or cord, or the nerve paths connecting the stomach with these centres." In addition to defective motor power in the stomach wall, there is almost always hypersecretion of the gastric juice.

Amongst other possible suggested causes are spasm of the duodenal or pyloric sphincter fibres, the pressure of a floating right kidney on the duodenum, dorsal decubitus during operation, volvulus of the stomach, gastric stasis and fermentation of the contents, swellings in the bursa omentalis (pancreatic cysts and abscesses), and a large gall-stone blocking the duodenum.

According to Laffer[3] the most frequent age for its occurrence is between 20 and 30. Only five occurred before 10; the oldest was 74. It is divided equally between the sexes. 38·2 per cent followed operation; 69 per cent of these after laparotomy. It is most common

after liver operations, then kidney, then appendix. It occurred eleven times after a variety of operations on the extremities. The onset is variable, and may be immediately, up to two weeks after operation, but most frequently on the third and fourth day. It occurred twelve times with chloroform and eight with ether. It has followed injuries to the abdomen, spine, thorax, head, extremities, etc.

Classified as occurring during the progress of the disease, pneumonia heads the list, then comes appendicitis. Cancer of the œsophagus, abscess of the jaw, localized or miliary tuberculosis, and brain disease are each recorded more than once. Spinal deformity, both with and without the application of a plaster jacket, has been noted as an accompaniment and probable cause. Typhoid fever, acute rheumatism, and scarlet fever have been associated with acutely dilated stomach. One case is recorded after eating thirty hard-boiled eggs for a wager.

References.—[1]*Wien. klin. Woch.* Ap. 30, 1908; [2]*Ann. Surg.* Mar. 1908; [3]*Ibid.* Ap. 1908.

STOMACH, DISEASES OF. (*See also* Gastric Ulcer.)

Robt. Hutchison, M.D.

Methods of Examination.—Schuele[1] discusses modern diagnostic methods in some detail. Inspection does not teach much, while careful palpation is capable of eliciting important signs, for example, "splashing." In cases of enteroptosis, an abnormal movability of the tenth rib should always be sought for. It is also important to examine the skin for hyperæsthetic areas, which point toward gastric ulcer. With regard to the position and size of the stomach, one can percuss out the greater curvature during standing. X-ray illumination further yields reliable results. Distending the stomach with carbonic acid or air (the former by giving an effervescing drink, the two powders to be taken separately) must be carried out with care, but if the quantity of gas used is not too great is of much value. It is of assistance to fill the colon with water first, when this is possible. With regard to X rays, the best method is to give a thickened soup containing a teaspoonful of bismuth. The bismuth produces a shadow on the radiograph. Turning to the determination of the quality and quantity of the secretion, he finds that the presence or absence of hydrochloric acid is the most important detail to determine. To carry this out, the patient is given a trial breakfast (Ewald) or a trial meal, and one hour after in the former, or three hours after in the latter case, the stomach is emptied by the tube, and the contents titrated against $\frac{1}{10}$ normal sodium hydrate solution. The total acidity is best determined by using red litmus paper as the indicator (phenolphthalein is not so reliable), while one uses Congo paper for determining the amount of free hydrochloric acid. The determination of combined chlorides can be carried out by various means, but this point is of minor importance. First it is necessary to measure the quantity of the contents of the stomach which is regained. Normally this is about 150 cc. Under

certain circumstances the quantity can be materially increased, and the condition is then spoken of as hypersecretion. When the hypersecretion is permanent, one mostly has to deal with a stenosis of the pylorus. It may be due also to some temporary cause, such as digestive or alimentary irritation. He next mentions Sahli's method (called the desmoid reaction) of giving a little indiarubber bag tied up with a piece of catgut, containing a methylene blue pill. If the peptic activity of the gastric juice is sufficient to dissolve the catgut, the blue will be absorbed and will be excreted in the urine after from four to six hours, or, in delayed cases, after twenty hours. It has, however, been questioned whether catgut cannot be digested in the intestine. Schuele has employed the method frequently, but has obtained irregular results. It is often necessary to give both the trial breakfast and the trial meal. In summing up, he finds that when the hydrochloric acid is absent and the total acidity is not more than 10, one speaks of achylia; when the total acidity is about 30, and the hydrochloric acid value low, one speaks of hypochlorhydria; when the total acidity is about 70 per cent and the free hydrochloric acid up to 0·1 per cent, of orthochlorhydria; and when the values are higher, of hyperchlorhydria. Lactic and acetic acids indicate fermentative processes in the stomach. Lactic acid is frequently found in connection with carcinoma of the stomach. Clinical experience teaches that when lactic acid is found in the gastric secretion the diagnosis of carcinoma is probable but not sure, while when it is absent the presumption that cancer is not present exists. An exception to this is when the motility of the stomach is good and yet there is some stagnation. To determine the motility of the organ, one gives a trial breakfast, and washes the stomach out after six hours. The organ should be empty. Various other methods also give reliable results. He considers that the examination of the stomach should be carried out in somewhat the following manner: On the first day, palpation after the bowels have been well cleared out; percussion and the various direct outside methods. On the second day, expression of the contents after fasting, and then washing it out; examination of the fasting contents for undigested bits, mucus, etc., or for acid (hypersecretion). On the third day, trial breakfast, washing out after six hours (for motility test). On the fourth day, trial breakfast, expression after one hour, and testing chemically. On the fifth day, trial meal, expression after three hours, and chemical examination. On the sixth day, radiographic examination. Mostly it is not necessary to carry out all these stages, but the plans for the first, fourth, and fifth days are essential in all gastric cases. The significance of occult or latent gastric hæmorrhage is next dealt with. The detection of blood in the fæces by the turpentine and guaiacum test, after rendering the fæces acid with acetic acid and extracting by shaking up with ether, is of value. It is, of course, necessary to determine that the patient does not eat any food which contains blood, such as beefsteak or the like, for some days before.

Wilcox[2] lays stress on the great importance of the estimation of the

active hydrochloric acid in stomach contents. He does not consider it correct to say that in carcinoma of organs other than the stomach the active HCl is reduced. He describes a new method of estimating the ferment activity of the contents. It depends on the addition of increasing quantities of gastric contents respectively to a series of test tubes five inches by three-eighths of an inch, each containing 5 cc. of milk. After mixture the tubes are left in a water bath at 40° C. for thirty minutes. At the end of that time the tubes are examined. Above a certain point in the series all the tubes will have undergone complete clotting, so that the contents do not flow out on inversion, while below that the contents can be poured out. The minimum quantity of gastric contents to cause complete clotting is a measure of the rennin present. Where the acidity is low the renninogen should be estimated by mixing equal quantities of 0·4 per cent HCl and gastric contents and carrying out the same method of estimation. In normal cases about 0.2 cc. of gastric contents is necessary to cause complete clotting. In gastric carcinoma the ferment activity is much reduced. 0·5 cc. or more of gastric contents is necessary to cause complete clotting. In congenital pyloric stenosis the rennin activity is raised. In marasmus and acid dyspepsia of children the ferment activity is lowered

G. Bastogi[3] has compared various methods by which the free, combined, and total HCl in fluids withdrawn from the stomach can be determined, and concludes that the Summer-Fischer method, described in 1903 in the *American Journal of the Medical Sciences*, is clinically the best and the quickest. Its sources of error are those common to all colorimetric methods, and it has the advantage of demanding no special chemical aptitude for its execution. It is carried out as follows: If the gastric contents contain free HCl, 5 cc. of the gastric filtrate are titrated with $\frac{1}{10}$ normal NaOH solution, with dimethylamidoazobenzene as indicator; this gives the free HCl. A few drops of phenolphthalein solution are added to the mixture, and the total acidity is titrated in the same way. Then add to the mixture a volume of $\frac{1}{10}$ normal HCl equal to the two quantities of $\frac{1}{10}$ normal NaOH that have been added to it, bring the total volume up to 30 cc. by the addition of 4 per cent solution of neutral calcium phosphotungstate, agitate, allow to stand a few minutes, filter (to decolorize) through animal charcoal, take 15 cc. of the filtrate and titrate again with $\frac{1}{10}$ normal NaOH, using alcoholic 1 per cent rosolic acid as indicator. This third titration, doubled, gives the combined HCl.

Einhorn[4] describes a method for testing the functions of the intestinal tract, the principle of which consists in giving test substances with the food to the patient, and watching what becomes of them. The test is briefly as follows: Patients are given in a gelatin capsule a string of beads with the following substances: catgut, fish-bone, meat, thymus, potato, mutton fat. After administering the capsule every stool is examined with the stool sieve until the bead string has been recovered. If diarrhœa is present the sifting may not be necessary,

as the bead string can readily be seen (usually at the bottom of a glass vessel). Under normal conditions the bead string appears after one or two days. It is then rinsed in cold water and examined. If digestion is normal we find that catgut, meat, and potato (except the skin) disappear entirely, thymus and fat almost entirely, whereas the fish-bone usually disappears, but occasionally it may be present. The nuclei of the thymus always disappear. In pathological conditions deviations from the normal are observed not only in regard to the time of recovery of the beads (disturbances of motility), but also in regard to the presence of the food substances (disturbances of the digestive function).

He classifies intestinal disorders according to the results of the test as follows :—

Group I : *Pure Nervous Intestinal Dyspepsias.*—The patients complain of various symptoms (fullness, wind, restless sleep, inability to concentrate their mind, general weakness, and lack of energy). Examination reveals an entirely negative result. The mobility is good, and the bead test shows normal digestion.

Group II : *Genuine Intestinal Dyspepsias.*—Besides numerous subjective complaints (tension, rumbling, irregular stool, etc.) the bead test shows evident deviations from the normal. This group can be subdivided into two subordinate divisions :

(*a*). Cases in which the digestion of all three nutritive substances (albumin, fat, carbohydrate) is disturbed—"*Dyspepsia intestinalis universalis seu completa.*"

(*b*). Cases in which the digestion of one or two nutritive substances is faulty—"*Dyspepsia intestinalis partialis.*"

This classification of functional intestinal diseases enables one to make a more accurate diagnosis, and at the same time affords certain indications for treatment. In the first group of pure nervous intestinal dyspepsias without any functional disturbances it will not be necessary to prescribe any special diet, or treat the intestine itself : we must rather strengthen the nervous apparatus (hydrotherapy, massage, climate, suitable occupation without over-exertion, etc.).

Group II of genuine functional intestinal dyspepsia will require a suitable diet : For dyspepsia intestinalis completa, first a fluid diet, later food in finely subdivided form ; in partial intestinal dyspepsia we must limit the amount of those food substances the digestion of which is disturbed. Medicinally we can also proceed with more certainty and success.

In dyspepsia intestinalis universalis, also in those forms of dyspepsia intestinalis partialis in which the albumin or fat digestion was disturbed, the pancreas preparations (especially pankreon) seemed to be of benefit.

In that great class of intestinal dyspepsia in which the starch digestion alone is disturbed, takadiastase (takamine) has proved of especial value.

Œsophagus.—Ewald [5] describes a case of *idiopathic dilatation* of the œsophagus which he was able to diagnose during life.

The patient was a male, aged 30, who first consulted Ewald three years previously. Six years ago he suffered from a peculiar form of eructation, which was not accompanied with any noticeable odour, and which was independent of taking food. In the autumn of 1903, he was seized with sudden incapacity of swallowing any food. At each attempt violent retching set in, ending in the vomiting of the food. He was troubled considerably at this time by collections of tenacious mucus in the œsophagus, which he succeeded in dissolving in seltzer water. On one occasion he vomited a bright red piece of tissue, which a doctor diagnosed as a portion of an œsophageal ulcer. Since then he at times felt well, and at times was incapable of swallowing anything. He often vomited food which he had eaten many days previously, while food which he had taken recently was not returned. The reasons which Ewald found against the condition being due to carcinoma of the œsophagus or ulcer leading to a stricture were as follows: The patient's age spoke against cancer. There was no enlargement of lymphatic glands, and no blood had ever been detected either in the gastric contents or in the fæces. The stomach tube passed without difficulty as far as the cardiac end of the stomach, and either passed through this or was stopped in this situation. Lastly, the history of six years' suffering, beginning with nervous eructations, was of diagnostic importance. The diagnosis had to be made between idiopathic spindle-shaped ectasia and diverticulum. Rumpel's test decided in favour of the former. He carried out the test as follows: A hollow tube was passed into the supposed diverticulum, while a second was passed into the stomach. If a diverticulum had been present, the water, which was introduced through the first tube, would only be regained through the second after this had been withdrawn from the stomach and passed into the diverticulum. He was able to regain all the fluid out of the stomach. A tube perforated in the distal 25 cm. was passed into the stomach. A second ordinary tube was passed into the sac. Through the second some coloured fluid was poured in. One minute after this no more coloured fluid could be withdrawn from the sac, but coloured fluid could be regained from the stomach through an ordinary tube passed into the organ. It was therefore quite clear that the sac in the œsophagus was a simple dilatation, and not a diverticulum. Everything in connection with the case spoke against the existence of an organic stenosis, and in favour of a smooth transition between the dilated part and the healthy part of the œsophagus. Examined by the œsophagoscope, the gullet did not appear to be stenosed, but the picture was not very clear. Lastly, Ewald gave the patient 200 cc. of potato bismuth emulsion, and illuminated his œsophagus by means of X rays. The shadow was not clear enough to determine with certainty whether the gullet was equally dilated, but, as the other signs were undoubted, the diagnosis was made without hesitation. The patient was fed partly by means of nutrient enemata, but this had to be desisted from later. He was then fed by stomach tube alone. In spite of strengthening food, the patient lost weight and strength, and died on March 24th, 1907. On post-mortem examination the œsophagus was found to be enormously dilated throughout its whole length, but no stricture was present. The diagnosis was therefore confirmed.

Lerche[6] describes a very similar case which was due to chronic cardiospasm. He regards the etiology of idiopathic dilatation as far from clear, but thinks that it may result from different causes; that those in which there is primary cardiospasm should be distinguished from those in which there is primary atony. He discusses the literature of the subject very fully, and gives an extensive bibliography. Geissler[7] describes a special instrument for the treatment of cardiospasm, for an account of which, however, the original paper must be consulted.

Abbe[8] speaks very highly of the "string-cutting" method of healing impermeable œsophageal strictures, as the result of fifteen years'

experience of its use. He describes in detail the method of using it, with illustrative cases. In similar conditions Zuberbühler [9] recommends electrolysis.

Phlegmonous Gastritis.—Cases of this rare disease have been described recently by Hall and Simpson,[10] and by Cecil,[11] but cannot be summarized here. The former authors give full references to all previously published cases—ninety-six in all.

Gastric Ulcer.

Diagnosis.—Bönniger [12] describes an ingenious aid to the diagnosis of this condition, which depends upon the fact that contact of the ulcer with dilute hydrochloric acid produces pain. He proceeds as follows: The stomach tube is passed in the morning whilst the patient is fasting. If no contents are obtained by gentle expression, 100 cc. of water are run in. As a rule in ulcer cases this causes no pain. After a few shaking movements of the patient the water is run out again, and can be examined for acid, blood, epithelial cells, and mucus. He then runs in 100 to 200 cc. of $\frac{N}{10}$ HCl solution. If an ulcer be present, pretty severe pain is immediately felt, which disappears if the patient drinks milk. If no pain is experienced, the acid is brought into contact as far as possible with all portions of the wall by shaking the stomach or changing the patient's position. If there is still no pain the presence of an ulcer can be excluded.

Treatment.—Lenhartz [13] reports upon the results obtained in 185 cases of recent ulcer, accompanied with bleeding, by his method of treatment. It is based on the following principles: (1) Neutralization of acid by concentrated proteid food; (2) Improvement of the general condition by rapidly enriching the diet; (3) Prevention of gastric distention by rest in bed for three or four weeks, the use of an ice-bag, bismuth, and avoidance of much fluid in the food.

He considers fresh eggs in daily increasing quantity the best article of diet. He gives only small quantities of iced milk, not more than 200 cc. to start with, for fear of overstretching the organ and irritating the ulcer. On the sixth day meat is allowed; on the seventh, rice; on the eighth, toast; and on the tenth, butter. Sugar is added freely to the eggs from the third or fourth day. He claims the following advantages for this system: (1) Pain disappears early—by the fifth day at latest; (2) Vomiting quickly subsides; (3) Relapses are rare. Out of 201 cases so treated, six died—five of progressive anæmia, in one of which the ulcer proved to be duodenal. He does not believe that it is possible to rest the stomach completely by rectal feeding, because it is kept irritated by hydrochloric acid. Lambert[14] also reports favourably on the results obtained by Lenhartz's method in a few cases.

Gastrostomy.—Dawson,[15] in an Address on "The Diagnosis and Operative Treatment of Diseases of the Stomach," advises against gastrostomy in malignant disease of the *œsophagus*. In malignant disease of the *stomach* he is in favour of radical treatment if the case is seen early enough, for there is then something substantial to gain in

return for the risk. In cases seen too late for this it is best to advise against gastro-enterostomy, because the immediate risk is great, and there is not a sufficient prospect of advantage to balance it. Where, however, the pylorus is obstructed by a *circumscribed* growth, operation may be worth while.

The results of operation in chronic gastric ulcer are very favourable. Of sixty patients interrogated not less than two years after the operation, the great majority had experienced much benefit, although relapses are not unknown. If the symptoms of ulcer do not abate within reasonable time under medical treatment, or if the symptoms keep recurring as soon as the patient is up and about, or if there is repeated hæmorrhage, operation should be advised. If the stomach shows signs of failure of motor power, there should be a period of rest in bed, with careful dieting, and strychnine immediately prior to the operation, bearing in mind that most often risk of operation belongs to those cases in which the muscular power of the stomach is spent.

He is strongly opposed to operation for *Hæmatemesis*, for these reasons :—

1. The operation must be a severe one, involving pulling on the stomach, and incision into its wall and a search of its interior, and all this at a time when the patient is exhausted by a loss of blood.

2. Hæmatemesis may have multiple points as distinct from a single point of origin, and we have no means of knowing beforehand which condition exists in any given case, nor even is there opportunity to enquire. To place sutures round numerous small bleeding points of the mucous membrane is almost a futile proceeding : for one point that is seen there are several that are unseen.

3. Medical treatment of hæmatemesis is successful, and the mortality is not appreciably more than 3 per cent, though it is only fair to state that Mansell Moullin puts it at 6 per cent. In first attacks of hæmatemesis the mortality would probably be even lower. For the *atonic* or *non-obstructive dilatation*, gastro-enterostomy, whether judged by the modifications in function it produces or by actual clinical results, is rarely a necessary or desirable treatment. Failure of motor power, which is its marked characteristic, not only makes the operation risky, but detracts from the chances of its success. Muscular efficiency is as essential for the stoma as it is for the pylorus ; and it has been shown that, in virtue of the arrangement of the muscular fibres, the pylorus is the preferential route, and if it is not obstructed, the stomach contents having reached it will leave by it. If pyloric spasm were a feature of atonic dilatation, there would be some justification for the stoma, but it seldom is. Again, atonic dilatation is more often associated with diminished than increased hydrochloric acid, and therefore no benefit can accrue from the passage of alkaline intestinal contents through the stoma.

In certain cases where dilatation is associated with marked gastroptosis, in which the contents have to be propelled, so to speak, uphill towards the pylorus, or there may even be something approaching to

kinking at the exit, under these circumstances it is conceivable that the pyloric path may be so difficult that a stoma becomes of use. Further, medical treatment of dilated stomach, whether it is or is not associated with gastroptosis, is often satisfactory in its results. Mere enlargement or prolapse of stomach is not necessarily a bar to efficient motility. Such stomachs can be made to empty in spite of the mechanical disadvantages which they present, provided their motility is kept at top hole. This is done by careful dieting, which makes the work as easy as possible, by periodical massage, keeping the patient fit, drugs like strychnine, and insisting from time to time on periods of rest on a bed, or couch, the foot of which is raised. It is surprising how well these patients do with such treatment.

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STOMACH, SURGERY OF. (*See also* Gastric, Pyloric, and Duodenal Ulcer.) *Rutherford Morison, F.R.C.S.*

Gastro-enterostomy.—Eve[1] advocates the importance of an internal examination of the stomach. A speculum is introduced through an opening made in its posterior wall, and by means of an electric head-light the whole of the interior is examined; this is followed by digital examination should inspection reveal nothing. In one instance nothing abnormal was observed externally, while the speculum revealed a funnel-like ulcer in the neighbourhood of the pylorus, which extended into the liver substance. One of his cases of duodenal ulcer where gastro-enterostomy was performed, subsequently suffered from mucous colitis, which condition, according to R. Hutchison, is not uncommon after this short-circuiting operation. He considers that the operation of choice for ulcer is posterior gastro-enterostomy without a loop. Any form of entero-anastomosis should be avoided in ulcer, as it tends to diminish the flow of duodenal contents into the stomach, and appears to increase the risk of peptic ulcer. Finney's operation is attended with a higher mortality than gastro-enterostomy, is more difficult, and is contraindicated in ulcer because the duodenal contents would not pass into the stomach. In stenosis, gastro-enterostomy gives better drainage, and the results are admirable. Pyloroplasty is inefficient in stenosis, because the contraction frequently recurs. Excision of a chronic ulcer is rarely feasible, and is attended by a high mortality.

Augusto Mari[2] reports five cases of hyperchlorhydria operated upon by gastro-enterostomy, and commends a study of the results to physicians and practitioners. In all these cases the patients left hospital recovered, with the gastric contents normal. In the majority

of cases it would be more correct to ascribe the symptoms to a gastric hypersecretion, as not only the hydrochloric acid but the gastric secretions as a whole are increased. Accepting the usual name of hyperchlorhydria, three forms are recognizable: (1) Neurotic hyperchlorhydria (functional); (2) Nervous hyperchlorhydria (organic) due to anatomical lesions in the centres and in the secretory nerves of the stomach; (3) Due to lesions in the stomach walls.

1. The first type (neurotic) affects chiefly young individuals of neurotic constitution or with a hereditary tendency to gastric disturbances, or those who abuse alcohol and, along with this, neglect attention to their food, whilst growing. The hypersecretion is not continuous, but only occurs when food is taken and at the height of digestion. During a fast the stomach is empty. Pain is seldom severe; there is more a feeling of weight; acid eructations are common; vomiting rarely occurs.

2. The nervous centres which regulate gastric secretion are yet imperfectly localized in man, but there can be little doubt that either these or the secretory nerves of the stomach are involved in the gastric crises of locomotor ataxia, in which hyperchlorhydria is almost always present. Other forms of nervous sickness, such as the periodical vomiting of Leyden, and periodical gastrosuccorrhœa, must be remembered in making a differential diagnosis.

3. The form due to anatomical alteration in the gastric parietes requires further consideration, because it is the most important of the three. The excessive secretion, which is continuous, results from a chronic hyperpeptic gastritis, and pain, vomiting, and dilatation of the stomach are the usual accompaniments. In the early stages there is a hyperplasia of the glandular elements, especially of the hydrochloric acid secreting cells, and these may even appear in abnormal positions, as in the pyloric region. At the same time there is congestion of the mucous membrane, with small hæmorrhages. As the disease progresses, there is an involution of the glandular elements and proliferation of the connective tissue, leading to sclerotic atrophy of the mucosa, and finally to the stage of atrophic gastritis.

The hyperchlorhydria leads to pyloric spasm, and this, along with the increased secretion, causes dilatation of the stomach. Some authors attach great importance to pyloric spasm; others think that in all cases of hypersecretion with difficulty in emptying the stomach, ulcer is present.

Moynihan,[3] writing on "Gastro-enterostomy and After," mentions that in 1881 Billroth, at Nicalodoni's suggestion, first performed the operation, the jejunum being attached to the anterior surface of the stomach, with the proximal end of the intestine to the right and the distal end to the left. The operation did not give relief, for regurgitant vomiting followed. In 1885 Von Hacker attempted unsuccessfully to improve matters by using the posterior surface of the stomach. In 1900 Petersen called attention to the need for the attachment of the jejunum to the posterior surface of the stomach at a point as close

to the flexure as possible : this no-loop method has proved successful. Moynihan formerly attached the jejunum obliquely to the posterior surface of the stomach, so that the lowermost portion was to the *right* and at the greater gastric curvature. W. J. Mayo experienced regurgitant vomiting with this method, and therefore made the opening obliquely from above downwards and to the *left*.

Moynihan thinks that kinks at the duodeno-jejunal flexure are normally prevented by the suspensory action of the mesocolic ligament, which allows a free swinging movement of the flexure to either side. He therefore considers that a vertical anastomosis in the middle line and as close to the flexure as possible is the best operation. Bilious vomiting after a no-loop operation is probably due to a mechanical obstruction caused by a partial rotation of the gut around its longitudinal axis at the time the attachment to the stomach is made. The part of the jejunum selected for the suture must be easily approximated, and without a twist or kink, to the posterior surface of the stomach at the place where the attachment is to be made. He has practised this method during the past four years, and has a mortality of 1 per cent. Good evidence has been given to prove that the fistulous communication made in a gastro-enterostomy is not used unless there is an accompanying pyloric obstruction. Up to December, 1905, he had operated upon 255 cases, which he has divided into four groups :—

	Cases	Deaths
1.—Perforating ulcer ..	.. 9	1
2.—Cases of acute hæmorrhage	.. 26	3
3.—Cases of chronic ulcer ..	.. 205	2
4.—Cases of hour-glass stomach	.. 15	3
	255	9

This gives a mortality of 3·5 per cent. Over two years later he obtained the present condition of these patients, and found that the best results were in cases where there was organic disease in the prepyloric or pyloric regions of the stomach or duodenum, or when the operation was performed on the cardiac side of a stenosis in the body of the stomach. Gastro-enterostomy is not necessary when there is an ulcer on the lesser curvature near the cardia ; the short-circuiting is either almost useless or entirely harmful ; the ulcer should be excised if possible. When there is a suspicion of malignancy in an ulcer or ulcers in the pyloric region, Rodman's operation (excision) should be performed. He concludes that gastro-enterostomy should never be done unless there is demonstrable organic disease ; that regurgitant vomiting is due to faulty apposition of the bowel to the stomach ; that the posterior no-loop operation with the vertical application of the bowel to the stomach gave the best results. There was post-operative bilious vomiting in only one case out of over two hundred.

H. W. M. Gray[1] points out that the stomach is composed of two distinct compartments, the cardiac and pyloric portion ; the latter when in the normal condition is entirely tubular. This normal

stomach form is seen in most perfect condition in the stomach of the fœtus before term. (*See Figs.* 97, 98, 99.) The cardiac portion is split up into two—a proximal sac-like and a distal tubular portion. In this last the food undergoes a preliminary churning with the cardiac juices

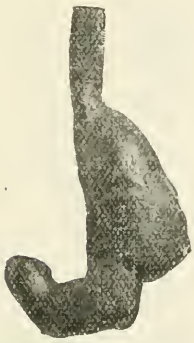

Fig. 97.—Stomach of a full-term fœtus, showing the physiological subdivision into a cardiac saccular portion and a tubular portion. (Cunningham.)

Fig. 98.—Stomach of a full-term fœtus in which the physiological division into two parts is seen. (Cunningham.)

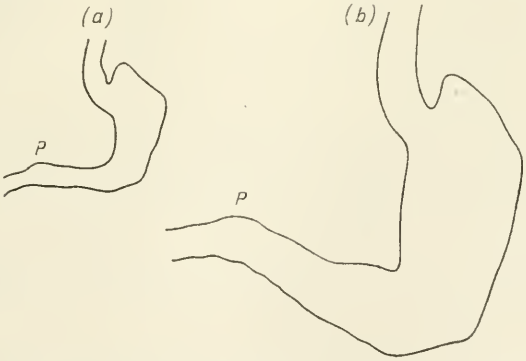

Fig. 99.—Tracings of (*a*) fœtal stomach at fourth month, and (*b*) fœtal stomach at full term. Cardiac portion distended with amniotic fluid, etc. ; P, pylorus. (From specimens in the Anatomical Department of Aberdeen University.)

before being passed on into the pyloric part of the organ. As the juices secreted by the different parts of the alimentary tract interact upon one another, the opening in the operation of gastro-enterostomy should be made as near to the pylorus as possible, in order to

preserve as much as possible the natural functions of the organs involved. The opening should be a large one, and provide for drainage when necessary, not of the cardiac, but the pyloric portion. The tendency to prolonged acidity in the pyloric end will be neutralized by the entrance of the alkaline pancreatic juice and bile. The escape of the acid chyme is not prevented by the pyloric sphincter, and takes place into the jejunum through the new opening at an early period, and will stimulate pancreatic secretion at an earlier stage than

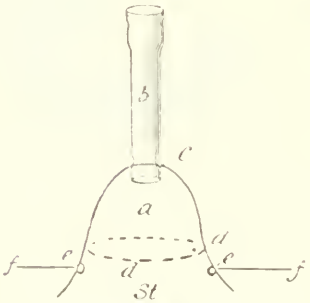

Fig. 100.

Fig. 101.

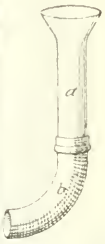

Fig. 103.

Fig. 102.

Fig. 104.

Fig. 100.—Diagrammatic representation of the operation of gastrostomy by the "Kader-Senn method. (*a*) Cone of stomach drawn out through an incision in the abdominal parietes. (*f, b*) Gastrostomy glass tube with apertures at *c* for fixation by suture of the tube into the opening at the apex of the gastric cone. (*d*) Purse-string suture for tightening after invagination of tube and cone. (*e, e*) Two of the four silkworm gut sutures used for fixing the base of the cone to the abdominal parietes. *Fig.* 101.—Gastrostomy glass tube (*a*); with vulcanite guide (*b*). *Fig.* 102.—Gastrostomy feeding syringe, with cork above, through which the piston-rod runs. (*b*) Rubber plug of piston rod. (*a*) Nozzle of feeding syringe for direct insertion into the stomach or for use with the gastrostomy tube. *Fig.* 103.—Glass filler (*a*), with rubber tube (*b*), for use with gastrostomy tube when syringe is not employed. *Fig.* 104.—Vulcanite plug for use between periods of feeding and for the maintenance of a patent fistula.

previously occurred in the patient. He considers that tonic contraction of the pyloric end of the stomach accounts for the prevention of regurgitant biliary vomiting. The action of the muscular coats in this portion of the stomach is stronger than that of the jejunum. In his experience bile is not present in the cardiac end of the stomach on washing out, but he believes that bile and pancreatic juice in small quantities are harmless in the cardiac end of the stomach.

A Method of administering Solids in Cases of Gastrostomy.—Maylard[5] has modified "Kader-Senn's" operation (*Figs.* 100 *to* 104) by using a glass tube in place of a rubber catheter; it is fixed to the cone of the stomach by two purse-string sutures, one at the apex, the other at the base. He has performed the operation sixteen times, with one death. The shortest times were six minutes when general anæsthesia was employed, and twelve minutes under local anæsthesia. Food which is practically solid can thus be introduced into the stomach.

Gastro-jejunostomy, and its Physiological Effects.—H. J. Paterson[6] considers that the presence of bile in the stomach after gastro-enterostomy is harmless, and that soon after the operation bile is present in the stomach in abundant quantity, but after a few weeks it diminishes. After operation there is a considerable diminution of the total acidity of the gastric contents, due not to the neutralization of bile and pancreatic juice in the stomach so much as to the presence of acid escaping into the jejunum, which sets the pancreatic juice flowing sooner than is the case normally, with the result that the gastric secretion will cease earlier, and following on this there will be a diminution of the total chlorides secreted by the gastric mucous membrane. He considers that the operation of gastro-enterostomy has no bad effect on gastric digestion. From a number of investigations concerning the motility of the stomach after gastro-jejunostomy, he finds that in those cases where pyloric stenosis is present and the motility before operation is very much delayed, there is usually a marked improvement in the evacuation of the stomach contents after operation. In cases where the motility is unimpaired before operation this may be slightly retarded, and in other cases hastened. The opening should be of large size in order to aid drainage if necessary. He considers that the beneficial effects of the operation are not due to drainage of the stomach, but to the diminution of the gastric acidity which occurs. From experiments, he finds that the operation has no material effect on the metabolism of the human body, the percentage of nitrogen and fat absorbed being within the limit observed in individuals who are healthy.

REFERENCES.—[1]*Lancet*, June 27, 1908; [2]*Il Policl.* Oct. 18, 1907; [3]*Brit. Med. Jour.* May 9, 1908; [4]*Lancet*, Feb. 22, 1908; [5]*Ibid.* May 16, 1908; [6]*Ibid.* Sept. 21, 1907.

STOMATITIS.

(*Vol.* 1907, p. 17).—**Formamint**, a combination of formaldehyde with menthol and sugar of milk, is a convenient and agreeable oral antiseptic. It is especially useful for children.

STRABISMUS. (*See* EYE, DIAGNOSTIC METHODS.)

STYES.

(*Vol.* 1897, p. 553)—In the pre-suppurative stage, the application of a cold solution of **Subacetate of Lead** may abort the attack. If suppuration is beginning, **Belladonna Fomentations** should be applied several times daily. When suppuration has occurred the stye should be opened by the insertion of a grooved needle. **Boric Fomentations** should next be applied, and calcium sulphide gr. $\frac{1}{2}$ given thrice a day internally.

SUBPHRENIC ABSCESS.

Rutherford Morison, F.R.C.S.

Barnard[1] says any localized collection of pus in contact with the under surface of the diaphragm is defined as a subphrenic abscess. He divides the under surface of the diaphragm into six spaces, four of these being intraperitoneal, and two extraperitoneal. The intraperitoneal spaces are separated from one another by the cruciform arrangement of the ligaments of the liver, the falciform and coronary ligaments forming the vertical moiety of the cross, and the right and left lateral ligaments the horizontal portion. Further, the falciform ligament divides the subphrenic space into two portions, right and left, while the lateral ligaments separate an anterior from a posterior portion. He thus names the intraperitoneal subdivisions: the right anterior, right posterior, left anterior, left posterior. The space between the layers of the coronary ligament where the posterior surface of the liver is in direct contact with the diaphragm is called the right *extra*-peritoneal space. The left *extra*-peritoneal space is situated around the upper end of the left kidney. The anatomical relations of each of these six spaces are given in detail, together with the etiology, signs, symptoms, and treatment of an abscess in each situation. He describes what he claims to be a new intraperitoneal fossa, which connects the pelvic cavity with the left subdiaphragmatic area. It lies deeply in the left lumbar recess. To the right it is bounded by the vertebral column; the descending colon bounds it to the left, whilst it is roofed in by the back of the mesentery. Below, it communicates over the left sacro-iliac joint with the retrovesical or recto-uterine pouch. Above, it runs up the duodeno-jejunal flexure, and there the pus passes forward in the splenic flexure to reach the left anterior subphrenic space.

He considers the main cause of a subphrenic abscess is gravitation. When a patient is in the supine position, the posterior subphrenic spaces and the pelvic cavity are separated from each other by two elevated mounds, consisting of kidney with perinephric fat and the loin muscles and tissues. A general peritoneal exudation results in gravitation of the fluid into one or other (or both) of these dependent pouches. As a means of diagnosis, the exploring needle is invaluable. A good aspirating needle 3 in. in length is required, and full anæsthesia should always be employed for its use. He systematically explores through the intercostal spaces (from the 10th to the 6th spaces), and from below upwards. He makes this search in the scapular and midaxillary planes, and mentions that the whole length of the needle must be introduced. He describes the various operations for drainage of the abscess, and found that the best results were gained when the posterior transpleural thoracic operation was employed. After the exploring needle has located pus, three inches of the rib below are resected, the diaphragm is sutured to the intercostal muscles, and the pus evacuated.

REFERENCE.—[1]*Brit. Med. Jour.* Feb. 15, 1908.

SYPHILIDES. *E. Graham Little, M.D., F.R.C.P.*

Darier's assistant, Hamel,[1] working under the former's direction, has experimented with **Local Injections** of a weak soluble **Mercurial Salt,** and reports excellent results. The technique is as follows: A 1–2000 isotonic solution of cyanide of mercury with 1–200 stovaine is injected with a fine needle obliquely into the deeper part of the skin of the lesion to be treated; if ulcerated, into the substance of the ulcer. The quantity of the solution used was from $\frac{1}{4}$ to 1 cc., and injections were given daily or every two, three, or four days, with aseptic precautions. The general mercurial treatment was usually continued at the same time, but the local measures greatly accelerated the healing of the parts treated, and were found especially useful in ulcerated and infiltrated tertiary lesions, in some circumscribed ulcerative secondary types, and in leucoplakia linguæ.

Reference.—[1]*Ann. de Derm. et de Syph.* May, 1908, p. 280.

SYPHILIS. *J. W. Thomson Walker, M.B., F.R.C.S.*

The sero-diagnosis of syphilis is the subject of many articles, one of which by Professor Fornet[1] takes the form of a clinical lecture. He points out that Wassermann, Neisser, and Bruck were the first to institute researches on the sero-diagnosis of syphilis. They made use of a phenomenon first described by Bordet and Gengou. Certain substances when introduced into the organism are capable of producing an antibody, and are called "antigens." When these substances are placed in contact with the antibody itself, they combine with it to form a compound, and at the same time a third body, which is present in normal blood serum, disappears. This body is called the "complement" or cytase. This may be demonstrated by the effect of these bodies in producing hæmolysis. Hæmolysis only takes place when the red blood corpuscles are subjected to the action of two substances, one of which, the complement or cytase, may be rendered inert by heating to 56° C., and the other, the amboceptor or sensitizing substance, resists a temperature of 56° C. Further, hæmolysis of a mixture which contains the three necessary elements—red corpuscles, the sensitizing substance, and the complement—may still be prevented by a double addition of antigen and antibody, which, by combining with each other, absorb the complement and so prevent hæmolysis taking place. The antigen may be a culture of typhoid bacilli, and the antibody the serum of a typhoid subject. To the hæmolytic mixture above described, a bacillary culture of typhoid bacilli (antigen) and the serum of a person suspected of typhoid fever may be added. If hæmolysis does not take place, it is because the serum contains the typhoid antibody, so that the patient is really suffering from typhoid fever. In the contrary event a non-typhoid diagnosis is made. On this principle Wassermann based his method of sero-diagnosis of syphilis. Although a pure culture of the pathogenic agent of syphilis cannot be obtained to act as an antigen, it has been found that an extract of syphilitic liver gives the same results. For

a description of the method of preparing this extract, the hæmolytic serum, and the cytase or complement, and the procedure adopted in carrying out the test, reference must be made to the original article and to those of M. Stern,[2] J. Bauer,[3] and Butler.[4] By the method Wassermann, Neisser, and Bruck have established the presence of syphilitic antibodies in monkeys inoculated with syphilis and in individuals suffering from syphilis, and finally in the cerebrospinal fluid of persons suffering from locomotor ataxy and general paralysis, and the reaction was not obtained in the serum or cerebrospinal fluid of persons free from syphilis. Later, the extracts of syphilitic liver were replaced by alcoholic extracts of more readily accessible organs.

In order to simplify, if possible, the sero-diagnosis of syphilis, Professor Fornet and M. Cherechevsky endeavoured to substitute direct precipitation for fixation of the complement. "Just as hæmolysins have been shown to be produced by the injection of sheep's blood into the rabbit, so the precipitins are produced, still in the rabbit, if we inject typhoid bacilli or white of egg. After a time the serum of this animal acquires the property of rendering turbid, in the first instance, a filtered culture of typhoid bacilli, and in the second a clear solution of ovalbumen. This precipitation is absolutely specific, and is provoked by the combination of the precipitinogen (white of egg) with the corresponding precipitin (serum of prepared rabbit). This method and that of Wassermann sometimes give a reaction with other diseases, such as trypanosomiasis, framboesia, etc., which have many clinical and pathological points of resemblance to syphilis. The reaction may be wanting at all periods of syphilis, even when in active evolution. Fornet believes that the careful application of sero-reaction is capable of affording useful information in the diagnosis of syphilis, both clinically and pathologically. Owing to the difficulties in carrying out the method, it is only reliable in the hands of those familarized by experience with the manipulation of hæmolytic investigations.

Meier,[5] in an important article, discusses the technique, the applicability, and the clinical importance of the Wassermann reaction. He concludes that the reaction is specific for syphilis, and on account of its accuracy it is a very important addition to the means of diagnosis. The technique is so complicated that in order to obtain reliable results it must be carried out by an experienced investigator.

Elias, Neubauer, Porges, and Salomon[6] have investigated the question whether the Wassermann reaction is specific or not. They found that a slight or medium diminution in hæmolysis was not diagnostic of syphilis, since a slight diminution was given by a comparatively large number of patients with tumours, and five out of twenty-five tuberculous patients gave it to the second and third degrees. Only the absolute prevention of hæmolysis was convincing, but even this was only so when the symptoms were in agreement, since complete prevention of hæmolysis was also present in a diabetic patient of twenty years, although he was not syphilitic.

Mühsam[7] finds that the serum diagnosis of syphilis is clinically specific; that a positive reaction is a proof of the presence of active syphilis in the body; that a negative result does not always show that the body is free from syphilis. A negative serum reaction may be found where a syphilitic infection has taken place (1) in cured cases, (2) if a small amount of complement binding substance has yet been formed, (3) perhaps in refractory cases, (4) perhaps in the negative phase of reaction of the body.

According to Professor F. Karewski,[8] a negative result in the serum diagnosis has no weight. A positive result shows more quickly and certainly than any other method whether syphilis is present or not. This is important for the surgeon, for it supplies reliable proof where other signs of syphilis are absent and the history does not give trustworthy evidence.

In an important contribution read before the Berlin Medical Society, Citron[9] expressed the opinion in regard to the complement fixation method of diagnosis that we could neither say that it was specific or non-specific. Working with Blumenthal and Blaschko, he was able to make the statement that the complement fixation gave a positive result in almost all cases of syphilis. The diseases which have been looked upon from a purely clinical point of view to be connected with syphilis, such as general paralysis and tabes, give an almost equal reaction to syphilis itself. In the non-syphilitic individuals this reaction is never given, or only with very few exceptions. The author quotes a number of interesting cases where the serum diagnosis and the clinical examination did not coincide, but where the autopsy showed lesions very suspicious of syphilis. Citron has never seen the reaction in absolutely healthy individuals. The author believes that the method of fixation of the complement by using a watery syphilitic extract gives with certainty a diagnosis in regard to syphilis when the reaction is positive. A negative result is not so convincing. In primary syphilis the reaction is positive in 90 per cent and negative in 10 per cent. In the negative cases there are two possibilities—the general infection may not have taken place, or the general infection may have taken place but the reaction has not yet commenced. In secondary syphilis the reaction in almost all cases is positive (98 to 100 per cent). In the period of early latency which follows the secondary period, 20 per cent of cases are negative. In the late period with symptoms the percentage of positive reaction again rises. Whether these include cases that were negative or not in the early latent period is not yet known: it is only known that the serum reaction is the indicator of an active syphilis, and in the tertiary stage a positive reaction is the rule. Then comes a period in which the positive reaction rapidly falls (43 to 50 per cent negative). Experiments on apes show that in syphilis treated with atoxyl, it is possible to reinfect the animals at a certain period which corresponds to the latent period in human beings, but that if the syphilis is untreated, it is impossible to re-infect the animals at this period. Citron therefore

suggests that it is the untreated cases of human syphilis in which a re-infection is impossible that show a positive reaction, while in the treated cases a negative reaction should be obtained. According to Citron, no one can be looked upon as cured who has not a negative reaction. Such a cure is not identical with a clinical cure.

In the future, he recommends that when a primary chancre is found, the spirochæte should be searched for and the serum reaction tested. (1) If the spirochæte is found and a positive serum reaction obtained, treatment should at once be commenced instead of waiting for a rash. (2) If the spirochæte is not found and there is a positive serum reaction, there is again no need to wait for a rash before commencing treatment. (3) If the spirochæte is found and the serum reaction is negative, this is an indication for a local attack. What the local measures should be he leaves to the individual surgeon. At the same time general treatment should be undertaken, for it is possible that a few isolated spirochætes may have passed as far as the neighbouring glands. It may be possible by this continued treatment to abort the syphilis. (4) When the spirochæte cannot be found and the serum reaction is negative, the author would not undertake treatment from the clinical signs only, but would advise waiting and making another serum reaction test in four weeks or two months, unless it happens that specific symptoms appear before that. From time to time during the intermission of treatment examination should be made, and the commencement of a new course of treatment be dependent upon the result. This would, the author holds, not lead to an increase in the treatment, but probably to a diminution in it. The examination would require to be repeated for a long time, since it is not known if a negative reaction indicates latency or cure. On the other hand, there are cases that give a positive reaction after many years, and in these the treatment would require to be continued for a longer time than is now customary.

In regard to syphilis immunity, Citron would not go so far as Neisser, and say that it is completely set aside, but believes that the complicated cases of Colles's law are shown by the serum diagnosis only to be another course of syphilis, or a latent form, and the apparent immunity of the mother of the child is only a demonstration that in active syphilis a re-infection is more difficult to produce and takes another course. Other articles discussing these points have been contributed by Citron,[10] Elias, Neubauer, Porges and Salomon,[11] Kroner,[12] Fischer,[13] Michaelis and Lesser,[14] Fleishmann,[15] Sachs and Altmann,[16] Lesser,[17] Grosz and Volk,[18] Blaschko,[19] Beneke,[20] Fraenkel and Much.[21]

In an article on the specific nature of the precipitation reaction in syphilis and paralysis, Fornet and Schereschowsky[22] state that normal sera from healthy individuals unmixed with each other show no precipitation. Precipitations which appear after the addition of normal saline solution to one or both sera should not be confused with the specific precipitation. The non-specific character of such precipitation shows itself among other ways by its occurring in one

or several control experiments. Thus a precipitation reaction is only to be looked on as positive where a definite precipitate in ring form occurs and numerous controls remain clear.

Plaut and Heuck[23] dispute the specific nature of this reaction, and they are supported by Bauer[24] and others. J. Citron and K. Reicher[25] have studied the property of syphilitic serum of splitting up fats, and the importance of this lipolysis in the serum diagnosis of syphilis. In the Wassermann reaction a fat-containing extract is mixed with syphilitic serum and a complement. According to the researches of Citron and Reicher, a splitting of the fat takes place and fatty acids are liberated. A part of these fatty acids are at once changed into soap, which, as is known, can immediately destroy the antigen. Another part may serve *in vitro* to diminish the alkalinity of the syphilitic serum, and thus create the best conditions for a Wassermann reaction; so that the parallelism which exists to a certain degree between the formation of a complement and the lipolysis is most simply explained.

Maclennan[26] believes that the *Spirochæta pallida* represents only a part of the life cycle of the organism. For clinical purposes the demonstration of the organism in a smear preparation is easily carried out, although sometimes a prolonged search is necessary. The author holds the opinion that the recognition of a single undoubted *S. pallida* in a smear from a probable lesion would place the diagnosis beyond question. Glycerin kills these organisms very quickly, and therefore the risks of transferring syphilis by vaccination is very slight. Living, unstained spirochætes are difficult to recognize. The organism is easily demonstrated in the primary sac, but is difficult to isolate in secondary lesions, since it exists here in the deeper layers. It is plentiful in the congenital rashes. The spirochætes have repeatedly been found in tertiary lesions, but for diagnostic purposes they are a negligible quantity. The silver staining of spirochætes has added another means of diagnosis in disputed cases and in those unsuitable for examination in smear preparations. It has also shown the sites preferably occupied by the spirochætes, namely, glandular epithelium and connective tissue.

Experimental Syphilis.—Metchnikoff[27] discusses the recent work that has been done in this line. It has been found that animals, and especially apes, are susceptible to syphilis, and that the higher apes are more easily inoculated than others. It has been shown that tertiary lesions in man are infectious. The blood of syphilitics is now known to be infectious, and the syphilitic virus has been demonstrated in the blood and in the spermatic fluid, but the spinal fluid has not been shown to be infectious. The inoculation of syphilis in apes may be used in the diagnosis of a doubtful chancre or of secondary lesions. The serum diagnosis of Wassermann is a further means. Endeavours have been made to obtain an antisyphilitic serum, but without success. The researches in regard to the production of a vaccine have given some promising results. Roux and Metchnikoff have

experimented with preparations of mercury to obtain a protective preparation, and state that they have found an ointment composed of 25 to 33 per cent of calomel and 75 to 67 per cent of lanolin is effective if rubbed into the spot of inoculation up to eighteen hours after the introduction of the syphilitic virus. Dr. Maisonneuve volunteered to test this upon his own person,* and an hour after being inoculated with syphilis the ointment was rubbed in. It proved efficacious, for no symptoms of syphilis developed.

In an article on prophylaxis applied to venereal disease in the navy afloat, Surgeon N. Howard Mummery, R.N.,[28] draws attention to the number of cases of venereal diseases in the navy and the loss of service entailed thereby. He recommended that prophylactic measures should be adopted, and these were the application of the results of the investigation by Metchnikoff and Roux. An ointment composed of 10 parts of calomel and 20 parts of lanolin is rubbed into the venereal abrasion. This might almost certainly be relied upon to prevent syphilitic infection if used not longer than twenty-four hours after inoculation. He recommended that special wash-places should be provided for the use of the men.

TREATMENT.—Spatz[29] has treated twenty cases of syphilis by **Intravenous Injections of Sublimate,** but in only six of these was this method continued to the end of the treatment. In the others thrombosis and inflammation in the neighbourhood of the veins interfered with its continuation. The largest single dose was 0·014 gram of sublimate. No sugar appeared in the urine, and diarrhœa was absent. A correctly administered intravenous injection is painless. The treatment was commenced with 2 mgrams of a solution of 1–1000, then every three days 1 mgram was added till a dose of 10 mgrams was reached, and then a solution of 2–1000 was used. Prolonged pain and swelling followed if the thin venous wall was punctured and the fluid reached the skin. The only patients suitable for this treatment are those with thick-walled large veins. Thin superficial veins become thrombosed in a short time. In favourable subjects 27 to 54 mgrams of sublimate was successful in several stubborn cases.

Boyreau[30] has used Professor Audry's method of **Rectal Administration of Mercury.** He used suppositories of grey oil (3 cgrams in adults and 1 cgram in infants daily). The drug was rapidly absorbed, and produced the full effect of the mercury. In cases where the treatment did not appear to be a success, inunction and intramuscular injections met with no better result. The method was painless and non-irritating. Pain and tenesmus were rarely observed, and, when present, subsided after a short interruption of the treatment. It was applicable to young children and useful in adults where stomatitis or gastro-intestinal troubles had supervened. It was unsuitable for old people,

* *Experimental Prophylaxis of Syphilis*, by Dr. Paul Maisonneuve, translated by Dr. F. L. de Verteuil. 4/- net. John Wright & Sons Ltd., Bristol.

intemperate subjects, malignant syphilis, and cases of rectal or anal disease.

M. Friedländer[31] recommends the use of **Mergal** in syphilis. This is a cholic acid mercuric oxide combined with tannate of albumin, and is dispensed in small capsules. It has the advantage over other preparations of mercury that it is readily assimilated and does not irritate the alimentary canal. This author states that preparations of iodine which have been proposed as substitutes for the iodides are less potent or they possess similar disadvantages. He orders the effervescing preparations of iodine in place of potassium iodide. If internal administration is inadvisable, or if a rapid, powerful effect is desired, intramuscular injections of **Iodipin** in 25 per cent solution are employed. Iodipin is a combination of iodine and sesame oil. It may be administered in tablet form.

Mergal is the subject of an article by Nagelschmidt,[32] who states that this preparation reaches the circulation with greater certainty than any other method except the rarely used intravenous injection. It is as free from unpleasant and dangerous effects as any other means of treatment. In 103 cases, including some of malignant syphilis, it was successfully employed. A. J. Grünfeld recommends the use of mergal in all cases of secondary or tertiary syphilis except when severe and dangerous symptoms are present.

A. Pöhlmann[33] states that in his experience the results obtained by the use of mergal were good, although a fairly large proportion—about one-third—suffered from stomatitis. He looks upon the drug as being useful in mild cases, but unsuitable for severe ones. It might also be employed where there were other non-syphilitic skin diseases which prevented inunction, and the patients were liable to mercurial dermatitis or to infiltration at the point of injection where this method was used.

A. Eysell[34] recommends **Insufflation of Calomel Powder** into the nostrils in snuffles in hereditary syphilis. He introduced by this means a decigram of a powder composed of equal parts of calomel and milk sugar into each nostril thrice daily. After a few days the local disease begins to improve, and if the insufflations are continued, the general symptoms are also affected. He applied this treatment also to plaques and ulcers in the nasopharynx and of the tonsils and gums. After the age of ten years the strength of the powder was increased to two parts of calomel to one of milk sugar. By making the patient take deep inspirations, the powder could be applied to the larynx and trachea.

The excretion of mercury in the urine, fæces, and sweat in syphilitics has been investigated by Diesselhorst.[35] He found that the mercury appeared in the urine on the fifth day after the commencement of inunction, and that the quantity gradually increased during the thirty-four days' duration of the rubbing and six days after it had been omitted. It never reached a very large amount. Two months after the end of the treatment there were still traces of mercury in

the urine. Traces were found in the fæces, and continued to be present for a month after the inunctions were omitted. There was a distinct trace of mercury in the sweat. There was no apparent increase in the excretion of mercury when the patient underwent a course of hydrotherapeutic treatment. After the mercurial treatment was completed, the drug was found in the excretions for at least a year. The urine contained a much larger quantity during the injection treatment than during inunction.

Balimier[36] has found the following formula particularly effective as an intramuscular injection in the nervous lesions of syphilis :—

R	Mercury Bromide	gr. 27	Sterile Water	ad ℥iiss
	Sodium Bromide	gr. 21		

Lafay[37] recommends the following formula for intramuscular injection of mercury :—

R	Calomel (finely powdered and washed with ether)	gram 0·40
	Wool Fat (anhydrous, containing 5 per cent of camphor) .. .. 3 parts	q.s. 1 c.c.
	Liquid Petrolatum (or Abolene) containing 5 per cent of camphor) .. .. .. 7 parts	

Mix and sterilize.

Each cubic centimetre of this oil contains 0·40 gram of calomel equal to 0·34 gram of metallic mercury.

Professor Kromayer[38] has introduced a new method of administering mercury, namely, by **Inhalation.** The patient wears a mask on which is a finely divided mercurial ointment. The mask might be worn over the mouth and nose during the night only, or also during the day. He found that the quantity of mercury which passed out in the urine did not differ from that excreted after intramuscular injection. The mask is worn for ten days.

P. Bendig[39] reports on twenty patients with fully developed secondary symptoms who were treated by Kromayer's method. After two or three nights' wearing the mask the symptoms began to improve. In five to six days the rash had disappeared in most cases, although it remained two or three weeks in some. In only one case was there any stomatitis, and this rapidly disappeared after removing the mask and applying chromic acid. Further observations are required to define the length of time it is necessary to use the method.

Professor Duhot[10] describes what he calls the *abortive treatment of syphilis*, which consists in the intensive administration of mercury before the appearance of the secondary symptoms. In order that the symptoms should be prevented, the treatment must be commenced before the twelfth day following the appearance of the chancre, or at latest before the seventeenth day. The chief difficulty is in diagnosis of the primary sore, but experience in the observation of large numbers of such cases greatly reduces the number of doubtful ones, and the discovery of the spirochæte is a further means of diagnosis. He considers the **Intramuscular Injection** of insoluble salts of mercury to

be the best method. Not less than fifteen to twenty injections should be given over a period of four months. The first three injections are made at intervals of five days, the next three every six days, and the remainder at intervals of eight days. Each injection contains 0·14 cgram of metallic mercury. During the two years following, ten or twelve weekly injections are given at intervals of two months. During the third and fourth years eight or ten injections at intervals of three months are given. The author is not convinced of the necessity of treatment during the third and fourth years. Only about 5 per cent of private and 15 per cent of hospital patients were unable to carry out this treatment. It is indispensable that the liver, kidneys, and other viscera should be healthy. The method is contraindicated in the aged, the cachectic, chronic alcoholics with renal inefficiency, in arteriosclerosis, and the subjects of plumbism and gout, in the tuberculous, and in pregnant women with albuminuria. Children bear the treatment well, the doses being proportionally reduced.

Lenzmann[41] has published the results of the **Intravenous Injection** of **Hydrochlorate of Quinine** in syphilis. He treated fourteen cases by this method. The most striking effects were obtained in secondary syphilis, the roseola fading and condylomata being absorbed. Similar favourable effects were obtained where mercurial treatment had been previously adopted. Good results also resulted in two cases of malignant syphilis and in two of tertiary syphilis. The author used a solution containing 10 grams of hydrochlorate of quinine and ·75 cgram of chloride of sodium in 100 grams of sterilized water. The solution should be kept warm, as the quinine deposits on cooling. The injection was made into a vein at the bend of the elbow. In adults 5 grams of the solution were injected, equivalent to ·50 cgram of hydrochlorate of quinine. In order to avoid vertigo, the treatment was commenced by injecting ·30 cgram, and the following day ·40 and ·50 cgram. In one case Lenzmann pushed the dose to ·80 cgram, but this dose should not be exceeded. The three first injections are made at twenty-four hours' interval, the two following at two days' interval, then every third or fourth day. In all, a cure necessitates 4·5 to 5·5 grams, in a period of fourteen to twenty days. The author believes this method may supplement mercurial treatment.

The results published by Lenzmann have encouraged M. Napp[42] to investigate this method of treatment. Considering the gravity of the procedure, he endeavoured to substitute subcutaneous or intramuscular injection, but no beneficial effect on the specific lesions followed. In order to avoid accidents from the idiosyncrasy of certain individuals in regard to quinine, the investigator administered three doses of 30 cgrams of quinine during twenty-four hours, and only submitted those patients to the intravenous injection who withstood this preliminary treatment satisfactorily. The two first injections were given with an interval of twenty-four hours, and the remaining injections every second day, the dose of hydrochlorate of quinine

injected being 50 cgrams. Twenty-two syphilitics were treated in this way, and eighteen were influenced favourably, but three of these had been also subjected to mercurial treatment and were therefore doubtful. The inconvenience of the method was insignificant. A sensation of lassitude and slight vertigo was sometimes experienced for one or two minutes, and then passed off. A passing cyanosis or a pallor of the face was observed in some cases. In seven cases there was induration and tenderness of the vein at the point of injection, but no other sign of inflammation. No singing in the ears was felt even by those who experienced this sensation after taking quinine by the mouth.

Arsenic was at one time used very extensively in the treatment of syphilis. It was laid aside for more than a generation, and has now been re-introduced in new combinations and under new names. P. Ferreyrolles[13] gives a short history of the vicissitudes through which arsenic has passed in this relation. Coming down to 1900, he says that under Brocq's influence arsenic was again used in the form of cacodylate of mercury and salicylarsenate of mercury. "Now," he continues, "it is proved that arsenic alone is an agent which, if not superior to iodide of mercury or to mercury, is at least equal to its predecessors, and that in a number of cases it may replace or be a valuable adjunct to them."

Hallopeau[14] injects daily 10 cgrams of **Atoxyl** subcutaneously between the chancre and the nearest lymph-glands. In two patients out of three the secondary symptoms disappeared for four to six months, and were followed by mild manifestations, and the third patient was free from symptoms for a year. Renault found these injections painful and ineffectual, and Gaucher[15] had a similar experience in a case under his treatment. Meszczersky[16] has found that atoxyl exercised very little influence on syphilitic condylomata. At the best, slight improvement was observed in condylomata which were tending to disappear, while even extensive syphilitic changes were either entirely uninfluenced or reacted very slightly. Atoxyl was a much weaker drug in syphilis than mercury, and it was not without the danger of causing sudden poisoning. It was especially dangerous where there were arterial changes or weak cardiac action. In the author's opinion atoxyl should only be administered in patients who cannot tolerate mercury or whose general condition has deteriorated. In severe symptoms of syphilis and in pregnancy, atoxyl is to be entirely avoided.

The credit for re-introducing arsenic as a useful drug in the treatment of syphilis is ascribed by Colonel Lambkin[17] to Uhlenhuth, who having observed the beneficial effects of atoxyl in sleeping sickness, inferred that it might also prove successful in another protozoal disease, namely syphilis. In an article recording his observations on a series of cases which were treated by arsenical salts, Lambkin gives the following useful explanation of the nomenclature of these bodies:—What are arylarsonate salts? The term "arylarsonates" indicates those

arsenates to which an aryl group is attached. The arsonic acids may be considered to be derived from arsenic acid by the replacing of the hydroxyl group by an organic radicle. The organic radicle may be a member either of the fatty or paraffin series, such as methyl, ethyl, etc., or of the aromatic or benzene series, as phenyl. The radicles of the former are known as "alphyl," and an arsonic acid of this type would be known as "alphylarsonic acid." When the radicle belongs to the aromatic or benzene series it is called an "aryl" group, and the arsonic acid would be an "arylarsonic acid." The original arylarsonate preparation used was introduced by a German firm under the name "atoxyl," which has recently been shown to contain 25·77 per cent of arsenic. It is a sodium salt of arsenic acid in which one hydroxyl radicle of arsenic acid has been replaced by an aniline radicle. When first introduced, this preparation caused little or no toxic effects, but later, from adulteration or other causes, numerous cases of toxic poisoning were observed by Hallopeau, Koch, and others.

Colonel Lambkin has made observations with an arylarsonate preparation named "**Soamin.**" This is sodium para-aminophenylarsonate, and contains 8·22 per cent of arsenic, equivalent to 30·1 per cent of arsenious acid. This is claimed to be free from toxic effects. Colonel Lambkin administers 10 gr. every other day until a total of 100 gr. has been given. The arylarsonate salts should not be given by the mouth, as they are broken up by the acid contents of the stomach and thus more easily produce arsenical poisoning. This observer uses the intramuscular method, injecting the drug into the upper third of the buttock. It may also be injected subcutaneously. The arylarsonate should not be used simultaneously with mercury, as the mercury dissociates the ingredients of these preparations. Fifteen days should be allowed to elapse before beginning treatment with either of these drugs after administration of the other. After the active signs of syphilis have disappeared under the influence of soamin, the question arises whether treatment should be discontinued altogether, or whether and when another course should be administered. These problems remain to be solved by further experience. In conclusion Colonel Lambkin says, "Without entering into the question as to whether the treatment of syphilis by arylarsonates is as efficacious or likely to become more so than that by mercury, which time and further experience can alone tell us, I consider that an important fact has been established—that is, that in these salts we are now in possession of a second specific for syphilis, and need not add that the importance of this cannot well be exaggerated."

Zange[18] does not consider that **Atoxyl** can replace mercury in the treatment of syphilis, since its effect on primary and secondary syphilis is irregular, uncertain, and even in the most favourable cases incomplete. Its action is more effective in malignant syphilis, but it is not so powerful as a course of calomel injections. In tertiary syphilis the introduction of atoxyl marks an advance in treatment, for cure has been obtained by its administration where the symptoms

had resisted mercury and potassium iodide. Here also, however, it is not the method of choice, but should be used when ordinary treatment has failed.

Hallopeau[49] has used atoxyl as the sole means of treatment in seventy-two cases of syphilis. He employed a 10 per cent solution and injected from 0·75 to 0·5 cgram into the gluteal muscles three times a week. The total number of injections for each patient varied from five to nine. The effect of the drug was most striking in cases of syphilitic roseola, papular syphilides, and tertiary ulceration, and in one case of malignant syphilis, rapid healing of the ulcers was brought about where mercurial treatment had failed Secondary syphilides which have ulcerated have sometimes been rebellious to this form of treatment; vegetating condylomata resist it, and lingual leucoplakia is entirely uninfluenced. Signs of intolerance of the drug sometimes show themselves, but are only occasionally severe. Abdominal pain, nausea, vomiting, diarrhœa, coldness of the extremities, and strangury have been noted, and sometimes cutaneous eruptions appear. It is necessary that the drug should be freshly prepared, for after a fortnight it tends to form poisonous by-products, and the same result follows heating to 100° C. Further, the drug apparently varies in toxicity and therapeutic properties, according to the source from which it is obtained. The bigger the patient the less likely, the author believes, is he to show symptoms of intolerance. Children and old people do not take the drug well, and the same may be said of patients suffering from renal or heart affections. Local applications of 1 per cent atoxyl solution were used, but the author was unable to state whether improvement followed this. One series of injections is, he considers, an inadequate treatment for syphilis, but he cannot yet decide how much more of the drug should be given. He thinks that mercury and iodide of potassium should be admini tered as well as atoxyl.

In discussing the arsenical treatment of syphilis, Professor Bettmann[50] expresses the opinion that this drug does not succeed in lengthening the latent period, and that outbreaks of secondary symptoms occur while the patient is undergoing the arsenical treatment. Three cases of malignant syphilis, where there was an intolerance of mercury and iodides, and where it was impossible to carry out the Zittmann treatment, received remarkable benefit from arsenic. Two of these cases were under observation for some months after the end of the arsenic treatment, and severe recurrence took place in the skin, which again disappeared under arsenical treatment. In a fourth case of malignant syphilis, the arsenical treatment was unsuccessful.

Civatte[51] discusses the important question of the *marriage of syphilitic subjects*. He applied for the opinion of authorities on syphilis in different countries. Only one of them considered that it was unjustifiable to permit marriage of a syphilitic. The others all laid down certain restrictions. Mercury should have been taken in sufficient quantity over a sufficient time. Some thought that the

patient might marry after four years' intermittent treatment, if during the last two years the patient had been free from symptoms. In England and America marriage was permitted two years after the inception of the disease. Most authorities insist upon a final safety cure just before marriage.

Schlasberg[52] discusses the question of the appearance of *tertiary syphilis* after thorough mercurial treatment. He records the history of 1500 registered prostitutes at Stockholm who presented symptoms of syphilis between 1885 and 1906. All received thorough mercurial treatment, but tertiary symptoms developed in 137. The number of courses of treatment undergone by these women did not show any difference between those who developed tertiary symptoms and those who remained free from them. The extent and severity of the secondary manifestations did not seem to have any connection with the prognosis.

In an article on the influence of *leucocytosis* on the symptoms of syphilis, Stern[53] states that he injected **Nuclein** solution, the property of which for giving rise to leucocytosis is well known. A 10 per cent solution was used, and 5 decigrams to 1 gram were injected every five days. Usually the injections were well borne, but some patients had a rise of temperature. The leucocytes were raised to 25,000, remained at this figure for twenty-four hours, and then gradually sank to normal the third day after the injection. During the administration of the nucleinate of soda the syphilitic eruptions and ulcerations diminished in intensity or disappeared completely.

Weil[54] has made observations on the effect of pure **Uranate of Ammonia** suspended in oil of vaseline (5 per cent solution). He believes that this drug possesses in certain cases as rapid an action in curing syphilitic lesions as that of the mercurial salts, without producing symptoms of intolerance.

The following method of preparing the well-known **Zittmann's Decoction** is given by Professor Montgomery,[55] and is recommended by him as the old and most efficacious form of the preparation :—

R	Sarsaparilla Root	100·00	Water	2600·00

Then add, well mixed up and in a linen bag :—

White Sugar		Calomel	4·00
Powdered alum	āā 6·00	Cinnabar	1·00

Allow to stand over-night in a covered porcelain or earthenware vessel. The next day boil gently for eight hours. Then add :—

Fennel Seed		Senna Leaves	24·00
Anise Seed	āā 4·00	Liquorice Root	12·00

The seed should be first brayed in a mortar, and the leaves should be cut fine. Allow the mixture to stand for three hours, and then strain off 2500 grams. This should be labelled "Zittmann's Decoction (strong)." The weak decoction should be made as follows : Take the dregs left after straining off the strong decoction, and add to them

Sarsaparilla Root	50·00	Water	2600·00

Boil gently as before for three hours, stirring frequently, and add :—

Lemon Peel	Liquorice Root
Cassia Bark	Short Cardamom Seeds āā 3·00

Allow to stand for three hours and strain off 2500 grams. Bottle and label "Zittmann's Decoction (weak)." The dose of the decoction varies. A wineglassful each of the strong and of the weak is a moderate dose. If it proves too laxative, less may be given. If the patient is kept in bed and the decoction taken warm, it adds to its efficacy.

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SYPHILIS (Cutaneous Aspects of).

E. Graham Little, M.D., F.R.C.P.

Neisser, as the result of three years' experimental work on syphilis, has adopted conclusions which may be summarized as follows : The spirochæte of Schaudinn-Hoffmann is the organism causing syphilis : wherever the spirochætes are found, syphilis is present. Negative results must be interpreted with great care, since the demonstration of the organism is not easy. In apes the typical primary sore develops from twenty to fifty days after inoculation, a period which corresponds with that observed clinically in man. Apes are subject also to the constitutional symptoms of syphilis, and the study of the disease in apes gives valid data for the study of the disease in man. Inoculation of matter derived from tertiary lesions proved equally successful, and produced the same symptoms as inoculations from primary sores. Inoculations from the blood were rarely successful, and this difficulty corresponds with the difficulty of finding the organism in the blood. Successful inoculations were twice effected with semen from infected animals. Outside the animal body the virus dies rapidly—probably

within a few hours—so that mediate infection by inanimate objects must be rare. The virus can be destroyed readily by physical and chemical methods, and the efficacy of the disinfection by calomel ointment recommended by Metchnikoff has been demonstrated anew. Even a better application is the following :—

℞	Hydrarg. Perchlor.	·25	Alcohol absolut.	·5
	Sod. Chlorat.	·50	Glycerini	100·0
	Aq. Dest.	2·00		

Lubrication of the penis before cohabitation, and disinfection afterwards, are recommended in any case of intercourse where infectivity is suspected. That syphilis can be cured is demonstrated by the fact that animals inoculated with the disease and subjected to treatment have later been again successfully inoculated. Neisser denies the fact of immunity, and lays down that only syphilis-free subjects can contract syphilis ; persons refractory to syphilitic infections are themselves actually syphilitic.

The serum diagnosis of syphilis introduced by Wassermann is strongly supported by Neisser, who says, dogmatically and categorically, "Only with the serum of a syphilitic person do we obtain a positive reaction." The negative result is, however, not of equal value.

The excision of the primary lesion, and cauterization of the wound with **Tincture of Iodine,** is recommended as a routine treatment, once the presence of the spirochætes has been ascertained. This method was frequently successful in aborting syphilis in animals, but would probably be less efficacious in man. Early general treatment is, of course, urged, and a new preparation of **Atoxyl** by Ehrlich, combined with the use of mercury, is specially recommended. The mercury is given either by injection or inunction, the atoxyl by injection. This treatment should be adopted in all stages of syphilis where the disease can be recognized with certainty. The routine of treatment should be continued for at least four years after general infection. Local lesions should also be destroyed as soon as possible, as they harbour spirochætes. The presence of latent syphilis is best revealed by the Wassermann test, and, when this is positive, treatment should be undertaken and continued.

SYPHILIS, CONGENITAL. *Prof. G. F. Still, M.D., F.R.C.P.*

There is some diversity of opinion as to the most correct name for this disease. Lucas[1] says that of the three terms, congenital, hereditary, and inherited, the last is to be preferred, inasmuch as the symptoms are not always present at birth, and the disease is not passed on indefinitely as "hereditary" would seem to imply. He regards it as "now generally accepted that the *Spirochæta pallida*, discovered by Schaudinn and Hofmann in 1905, is the true cause of the disease." Lucas considers that inheritance from the father alone is now put entirely out of court, for the spirochæte is too large to penetrate an ovum $\frac{1}{200}$ in. in diameter, and multiply, without destroying it. Inheritance, therefore, is invariably through the syphilized mother.

If the infection is virulent in the mother, the micro-organism penetrates the chorion or placenta, and there is miscarriage or death of the fœtus. Otherwise the placenta protects the infant until the time of birth, when the separation of the placenta allows infection to take place through the umbilical vein. Hence the fixity of date of the secondary exanthematous stage of congenital syphilis from a fortnight to three months after birth.

Infection by Milk.—Lucas has described the case of an infant who was suckled by its mother for three months after she had become infected with syphilis, and was during part of this time suffering with severe secondary symptoms; the infant showed no evidence of syphilis. This case proves that the milk of a syphilitic woman when received into the alimentary tract of a child need not convey infection. It does not of course prove that it cannot convey infection.

Infection by Semen.—The size of the spirochæte precludes it being carried in the spermatozoon, but it may still be conveyed by the fluid part of the semen. It seems necessary that this should be so to account for cases of congenital syphilis conveyed after the healing of the chancre in the father.

The vexed question of *transmission to the third generation* is raised again by Lucas, and he reports one case in which the offspring of parents who both had unmistakable evidence of congenital syphilis, nevertheless remained entirely free from the disease. If the tertiary symptoms occurring ten to twenty years after inoculation are due to renewed activity of the spirochæte, there seems to be no *a priori* reason why the disease should not be conveyed to the third generation; but there seems to be little if any satisfactory evidence that it ever is transmitted to the third generation, unless Fournier's 116 cases are to be accepted as evidence. Probably most observers in this country will share Sir Jonathan Hutchinson's doubts as to the possibility of such an occurrence. As Lucas points out, a person who is the subject of inherited syphilis is not immune from reinoculation after a certain period, so that even if his offspring showed congenital syphilis, it might not mean transmission to the third generation.

Very striking instances are reported by the same writer of the disastrous results of syphilis upon infant life. In two families only four children survived out of twenty pregnancies. A much-needed protest against the misleading term "parasyphilis" is made by Mr. Lucas, who points out that deformities such as hernia, and even nævi, have been described as dependent on inherited syphilis, and as if better to cover the anomalies, the term "parasyphilis" has been invented to add to the confusion.

Skin Lesions.—Adamson[2] summarizes the characters of the skin eruptions of congenital syphilis thus: (1) Appearance of eruptions at about the age of four to eight weeks; (2) Eruption consisting of disc-like, coppery-red macules, maculo-papules, scaly papules, or rarely bullous or crusted; (3) Eruptions situated about the genitals, buttocks, thighs, and often around the mouth and on the palms and

soles, and invading flexures and convex surfaces alike; (4) Other signs of syphilis: the child begins to lose its plump and healthy appearance, the skin becoming opaque and muddy-looking, snuffles, hoarse cry, fissures of the lips, iritis (rarely), enlarged testicle (rarely). The "syphilitic wig" and "old man appearance" are not characteristic signs of syphilis, but may be seen in any condition of malnutrition.

Stephenson[3] records the finding of the *S. pallida* in the eye in four cases of keratomalacia in infants with congenital syphilis between the ages of seven weeks and nine months. But as the same observer points out that spirochætes have been found in the tissues of seemingly unaffected eyes, these cases can hardly be said to support the specific etiological relation of this micro-organism to syphilis.

Carpenter[4] says that *craniotabes* is most often found in the second and third months of life—the syphilitic age—whereas after six months, that is in the rickety age, the decrease in the number of cases is most striking. Whenever he finds craniotabes in an infant he suspects syphilis.

Sutherland[5] classifies the *bone lesions* of congenital syphilis as (1) Syphilitic epiphysitis; (2) Changes in the skull, including craniotabes; (3) Osteogenesis imperfecta syphilitica, in which at birth many of the long bones of the extremities are found to be fractured. To these may be added the localized thickenings of the bones which, as Tubby[6] points out, are sometimes found at the epiphysis, forming an exostosis, and sometimes in the shaft, giving rise to a characteristic deformity, especially in the tibia, which has more or less the shape of a sabre. The affection of the epiphysis which is known as syphilitic epiphysitis is generally seen before the fourth month, and with the tender swelling of the epiphysis there is associated an effusion in the neighbouring joint, and if not treated the inflamed epiphysis becomes separated and suppuration may occur.

Treatment.—Lucas points out that since the discovery of the *Spirochæta pallida*, mercury, formerly given empirically, has come to be used as a direct antidote recognized as causing destruction of the parasite. Congenital syphilis in almost all its manifestations is remarkably and rapidly amenable to **Mercury.** Sutherland points out that even hydrocephalus, when due, as it sometimes seems to be, to a basic meningitis, can be treated successfully with full doses of mercury. Tubby says that even when pus has formed in a case of syphilitic epiphysitis, if it is let out early and mercury vigorously administered, it often happens that the epiphysis is saved and may reunite. In some manifestations of congenital syphilis—for instance in the synovitis, which occasionally occurs—better results are to be obtained by a combination of **Potassium Iodide** with mercurial treatment than by mercury alone, as Dunlop has pointed out; he mentions Gutterbock as having found that in such cases the employment of **Sublimate Baths** is often more efficacious than the internal administration of mercury, while others have thought **Inunction of Mercury Ointment** the most successful treatment. The present writer

has found the combination of daily inunction of 15 gr. of unguentum hydrargyri, with the internal administration of ½- to 1-gr. doses of **Grey Powder** three times a day very successful in cases where it was important to get the infant rapidly under the influence of mercury.

REFERENCES.—[1]*Brit. Jour. Child. Dis.* Jan. 1908, p. 1; [2]*Ibid.* p. 13; [3]*Lancet*, in *Brit. Jour. Child. Dis.* Jan. 1908; [4]*Brit. Jour. Child. Dis.* Feb. 1908, p. 35; [5]*Ibid.* p. 52; [6]*Edin. Med. Jour.* Dec. 1904.

TABES DORSALIS.

(*Vol.* 1899, p. 379)—For the relief of lightning pains, try the effect of **Hot Compresses**, or of **Compresses of Ether or Chloroform**, applied to the part affected. Sometimes **Mustard Plasters** are useful. In severe cases the **Injection of Morphine** may be called for.

TACHYCARDIA, PAROXYSMAL.

(*Vol.* 1901, p. 301)—During the attack absolute **Rest** is essential. An **Ice-bag** applied to the præcordium, with **Morphine** subcutaneously, alleviates distress. **Bromides** and **Suggestion Treatment** are of value in preventing attacks.

TELANGIECTASIS CIRCUMSCRIPTA UNIVERSALIS.

E. Graham Little, M.D., F.R.C.P.

At least three cases of this extremely rare condition have been reported in English medical literature during the past year. Osler,[1] who was one of the first writers to draw attention to this clinical group, reports in full detail an interesting case in a man aged thirty-nine. The telangiectases here appeared capillary, not venous, for they could be emptied on pressure; they were distributed thickly over the chest, back, flexor surfaces of the forearms, and inner aspects of arms. The hands and feet were cyanotic, as in Raynaud's disease. The telangiectases had lasted for two years, and exacerbations occurred from time to time, coinciding as a rule with severe abdominal pains and hæmorrhagic urine, but no diarrhœa. There was frequent epistaxis. Occasional urticaria was noted, and factitious urticaria, was a well-marked symptom. The case was seen again a year later, with no alteration in the skin symptoms. The abdominal crises were mitigated by acupuncture. There seemed a strong neurotic element in the case, a feature which was noticeable in one of the earliest instances reported by Vidal in 1880–81. There was no similar disease reported in the present patient's family, but Osler mentions another instance in which family inheritance was noted, as also in Phillips's case, described below.

Sidney Phillips[2] showed, at the clinical section of the Royal Society of Medicine, a case of multiple telangiectasis with epistaxis in a married woman aged fifty-six, in whose family there were three other examples of hæmorrhages from mucous membranes. In addition to cutaneous telangiectases there were vascular elevations on the tongue, which bled freely, and frequent epistaxis. I had an opportunity of seeing this case while in the wards of St. Mary's Hospital, where she improved after two months as an in-patient. Dr. Parkes Weber at the same meeting showed a similar case of multiple hereditary telangiectases with recurring epistaxis, in a woman aged sixty. Symptoms of hæmorrhage were also present in the fundus of both eyes. In this

instance, also, the patient's mother and several of the patient's children were similarly affected. In the discussion of this case, Dr. C. O. Hawthorne and Mr. Mayou mentioned similar cases that had come under their observation. It would appear, therefore, that the condition is not so excessively rare as Osler would seem to think. Females preponderated over males in the statistics, and the patients were commonly of ripe age. No tendency to hæmophilia had been established in any of the cases.

Colcott Fox[3] showed a similar case in a young woman, from whom no family history of epistaxis or hæmorrhages was obtained, but who had had repeated epistaxis since the age of ten, followed five years later by the appearance of telangiectases; these increased in number, and were distributed chiefly over the lower half of the trunk. Profuse bleeding from the rectum occurred several times, accompanied by abdominal pain, but apparently with a normal mucous membrane of the rectum, as revealed by the sigmoidoscope. There were no hæmorrhages in the fundus oculorum, nose, or pharynx; there was no personal tendency to hæmophilia or history of such inheritance. Fox summarizes the literature on this subject, and divides the recorded cases into four groups: (1) Cases with diffused areas or network of dilated vessels; (2) Cases in which dilated vessels form patches with more or less general distribution: (3) Cases with small papular or nodular angeiomata occurring in elderly people with considerable frequency; (4) Cases like those here described, with family history of recurring epistaxis and multiple telangiectases, grouped by Osler[4] under this heading. No suggestions are made as to treatment.

References.—[1]*Johns Hop. Hosp. Bull.* Oct. 1907; [2]*Trans. Roy. Soc. Med.* Feb. 1908, p. 64, and p. 65; [3]*Brit. Jour. Derm.* May, 1908; [4]*Quar. Jour. Med.* Oct. 1907.

TESTIS, INCOMPLETELY DESCENDED.

Priestley Leech, M.D., F.R.C.S.

Rawling,[1] having been dissatisfied with the results of operation in some cases of undescended testis, investigated the results of 120 cases admitted into St. Bartholomew's Hospital during the last five years. Of these 23 cases were admitted between the ages of one and ten: 64 between ten and twenty years of age: and 33 between twenty and over. In 63 cases the right side was involved: in 57 the left: and in 7 cases both sides were affected. In 30 cases the patient sought advice on account of chronic or recurrent attacks of pain, not very severe, but sufficient to very considerably limit the individual powers of work. In 9 cases acute attacks of pain were complained of, associated with nausea or vomiting, and swelling in the region of the incompletely descended testis: some of these attacks suggested torsion of the testicle. The great majority of cases came to hospital complaining of a lump in the groin, which proved to be the incompletely descended testis, associated with a hernial protrusion. This condition of associated hernia and

undescended testicle was present in 90 cases, that is over 75 per cent. Examination in the erect posture and the subsequent operative procedures showed that the process was almost always of the complete funicular variety, where the testis is more or less enveloped by the contents of the hernial sac. Several cases also showed irreducible hernia due to an omental tag attached to the wall of the sac or testis itself. One case was admitted with a strangulated hernia, and two with inflamed irreducible hernia. Under the age of ten years the testis seemed of normal size; but in those above the age of puberty the testis had not undergone the developmental changes peculiar to the sound side, being smaller and softer. The inguinally retained testes were unusually mobile. On exposure, the testicle and epididymis were smaller and softer than normal, the processus vaginalis extensive in the region of the testis, and the abdominal opening large enough to reduce the testis into the peritoneal cavity. The testis was removed in fifty cases, and a microscopical examination in twenty-seven showed that in fifteen, changes typical of the ill-developed or atrophic testis were present; in ten there was little alteration from the normal, and definite spermatogenesis was present; one was tuberculous and one malignant.

Treatment.—The various operative measures that may be done are as follows: (1) To place the testis in the scrotum; (2) Leave it in the inguinal canal; (3) Replace it in the abdomen; (4) Remove it altogether.

1. The results of forty cases of attempted scrotal placement may be summarized as follows: Four fair results; three promised unfavourably; eight not traced; twenty-five failures. From these results scrotal placement, except in the most favourable cases, is doomed to failure from the beginning.

2. To allow the testes to remain in the inguinal canal after curing the hernial protrusion. The objections to this course are: the inconvenience to the patient from the constant pressure to which the testicle is liable, the degeneration of the organ, the predisposition to malignant disease, infection, and torsion. As regards the increased liability to malignant disease, Russell Howard reports that out of fifty-seven cases of malignant disease of the testicle, nine (i.e. 15·7 per cent) occurred in the retained or incompletely descended testicle; in fifty-four cases of malignant disease of the testicle admitted to the Massachusetts Hospital, six (11 per cent) were of the partially descended testis; and Schädel reports forty-one cases of malignant disease, five (12 per cent) being in the incompletely descended organ. Therefore, in every hundred cases of malignant disease of the testes, in between eleven and fifteen cases the testis is incompletely descended, a very much higher ratio than that of the misplaced testis to the normally situated organ, which is probably about one in every thousand.

3. All evidence goes to prove that the testis when replaced in the abdomen loses its spermatogenetic function, whilst the internal secretion of the one normally placed testis amply suffices for the well-being of

the individual. Consequently the best interests of the patient are secured by removal of the organ.

4. In fifty cases the testis was removed, and whether the patients were above or below the age of puberty, there was apparently no alteration either in the development of the individual or in the procreative powers of those who entered into the married state.

Rawling thinks that hypertrophy of the remaining testis often occurs. In a patient with one incompletely descended testicle the condition may be watched up to the age of seven years, after which operation should be advised in case of failure in scrotal descent. After full exposure and division of cremasteric fibres and all restraining bands and removal of the peritoneal process, the operator will be able to gauge the possibility of scrotal placement; if this is apparently impossible, remove the testicle. In cases of double incomplete descent, operative procedures should be carried out well before the age of puberty, the canal exposed, the testis delivered, and the hernial protrusion cured. If the cord is fairly long, the testis should be sewn to the scrotum; if not, allow the testis to remain in the inguinal canal: the usual disadvantages of such a testicular position will be experienced, but the patient will at any rate have the advantage of possessing some power of species-reproduction if he marries early.

W. B. Coley,[2] of New York, from a study of 126 cases of mal- and undescended testicle in his own practice, and of the reports of other surgeons, thinks the following conclusions are justified: (1) The undescended testicle is almost invariably of little or no functional value. It often gives rise to pain, and is more subject to inflammatory attacks than the normally placed organ, and possibly (though this is by no means proved) is more subject to malignant changes. (2) The undescended testicle should never be sacrificed in children, and very rarely in adults, as it has been proved to be possible to effect a radical cure of hernia quite as well without the removal of this organ. In childhood the testis, even if it never attains any functional value, is nevertheless valuable for the development of the male characteristics of the child, as well as in promoting his general health. In the adult it should be retained for its influence upon the mentality of the subject, if for no other reason. (3) Operation should seldom be performed under the age of eight to twelve years, unless the accompanying hernia demands such operative interference, because in a considerable number of cases the testis descends spontaneously on the approach of puberty, unless double. Abdominal ectopia, unless double, had better be left untreated, inasmuch as operation is difficult and by no means free from risk. (4) Method of operation: Free opening of the inguinal canal, which is secured by Bassini's incision, thorough freeing of the testis from any adhesions or peritoneal bands, even with the sacrifice of some of the veins if necessary; bringing the testicle into the scrotum; suture of the canal without transplantation of the cord. He does not believe in suturing the testis; inasmuch as very satisfactory results can be obtained

without cutting away all the structures of the cord, except the vas and its vessel, he thinks this radical step very seldom indicated. (5) No case of double undescended testicle should be allowed to reach the age of puberty.

Starr,[3] of Toronto, has devised an operation by means of which he keeps the testis in position by means of a silver wire splint.

References.—[1]*Pract.* Aug. 1908.; [2]*Ann. Surg.* Sept. 1908; [3]*Ibid.* p. 351.

TESTIS, MALIGNANT DISEASE OF. *Priestley Leech, M.D., F.R.C.S.*

Few surgeons have the opportunity of seeing any large number of cases of malignant disease of the testicle, and a clinical study of fifty-seven cases by Russell Howard[1] is of interest. The cases are taken from the records of the London Hospital. During twenty years 110,000 male patients were admitted to the hospital, and of these only sixty-five, or '06 per cent, were suffering from malignant disease of the testicle; out of these sixty-five cases Howard has been able to verify the diagnosis by the microscope in fifty-seven cases. He says that from the clinical point of view, if not from the pathological, all new growths of the testicle should be considered malignant, in spite of the fact that enlargement of the organ may have been present for years without secondary deposits occurring. It is doubtful whether there is a purely innocent new growth of the testicle, and the growths described as adenomata differ very distinctly, both clinically and pathologically, from the simple adenomata seen in other organs, such as the breast. In some cases the tumour is apparently encapsuled and shut off from the normal testicular substance; but after complete removal of the organ and tumour, recurrence has taken place in the lumbar glands and in distant organs.

There exists a good deal of confusion as to the classification of malignant testicular tumours, different pathologists holding different views as to the structure of the same tumour. Accurate diagnosis can, however, only be made after removal, and it is therefore better from a clinical point of view to describe cases as malignant disease of the testis, the treatment being removal as soon as the diagnosis is made. Howard thinks it might, however, be well to differentiate the *fibro-cystic* variety from the other forms of tumour. Among the fifty-seven cases there were seven examples of fibro-cystic tumour, all of which showed similar microscopic characters, and these characters were never seen in the remaining fifty solid growths. The oldest patient was 60 and the youngest 1 year; the average age being 32; five cases only occurred in children under 12 years of age, and if these are omitted, and only the adults considered, the average age is just over 34 years, which is rather earlier than the usual age incidence of carcinoma. All cases in children were solid tumours without any trace of cystic growth, and the age incidence of cystic tumours lay entirely between 25 and 35 years of age; malignant disease has been met with in persons over 80, and fibro-cystic disease has been described in infants. The right side was more frequently

affected (33 to 24), and in no case were both testicles affected. It has been a disputed point for some years whether the imperfectly descended testicle is more liable to malignant disease than the normally placed organ; this is an important question, as the operation of orchidopexy is generally admitted to be unsatisfactory, and if it can be proved that malignant disease is more prone to attack a retained testis, this would be an argument in favour of removal of the organ rather than leaving it alone or returning it to the abdomen. Out of these fifty-seven cases nine, or 15·7 per cent, occurred in the retained testis, which is a far higher proportion than the number of retained testes to normal individuals. In eight of these nine cases the testis was retained in the inguinal canal, and in the ninth it lay just below the external ring. Two of the cases gave very clear accounts of recurring attacks of pain and swelling in the retained organ, which were probably due to recurring torsion of the spermatic cord. In all these cases the growth was solid and fleshy, but a few cases of cystic disease have been described in the retained testis. In one case where there was a retained testis the malignant disease occurred in the descended testicle.

Cause.—Venereal disease appears to play no part in the etiology. In twenty-seven cases there was no history of injury; in eight a definite recent injury preceded the growth; in one the history of injury was definite, but preceded the growth by some years; and in another the onset of the disease dated from an acute inflammation.

Duration of Disease when first seen.—The longest time that the swelling was said to have been noticed was eight years; the average time was six to twelve months, but examples of more than one year were not uncommon.

Physical Signs.—In all fifty-seven cases the disease affected the body of the testis primarily; the organ was uniformly enlarged, the growth for a long period being confined by the tunica vaginalis; in several cases the growth was the size of a cocoanut, and yet the testis retained its usual shape, and was smooth to the touch. Apparently none of the growths started in the epididymis. If the case is seen early the component parts of the testicle can be made out, but it is not easy to do so, and reliance must be placed chiefly on the hard, enlarged body. Testicular sensation may be present or absent. In the rapidly growing cases the organ has been punctured in the belief that fluid was present. Hydrocele can rarely be detected clinically, although there may be some excess of fluid in the cavity of the tunica vaginalis.

The *spermatic cord* is usually unaffected, except it is a little thickened by increase in the size of the vessels necessary to supply the vascular tumour and by the hypertrophy of the cremaster muscle that follows the increase of weight. Sometimes the cord is infiltrated with new growth and is nodular to the touch; the vas remains unaffected; the scrotum at first is normal and the skin not adherent to the tumour; the first sign of disease in the scrotum is enlargement in the size of the veins on the side of the tumour.

The *glands* first affected are the lumbar, and out of fifty-three cases when first seen they were found to be affected in eight. When these glands are affected a large deep-seated mass is to be felt on one side of the spinal column near the umbilicus. The mass is fixed and nodular, and does not move on respiration. There is no expansile pulsation, but the pulsation of the aorta is frequently transmitted through it. The tumour may be so large as to be seen on inspection of the abdomen. The inguinal glands were infected in one case without involvement of the skin of the scrotum. Ascites and œdema of the legs occur in the later stages.

Diagnosis.—The diagnosis has to be made from hæmatocele, hydrocele, chronic orchitis, and tuberculous disease.

Hæmatocele is the condition most frequently confused with malignant growth, the diagnosis of malignant disease being usually made. If the hæmatocele is not recent and the history of injury is absent, the diagnosis by means of physical signs is not possible. The diagnosis can be settled by waiting and seeing if the tumour increases in size, but in cases of malignant disease this delay is dangerous, and the question should be settled by an exploratory operation with permission to remove the testis if necessary. It must not, however, be forgotten that a blood-stained hydrocele is present with malignant disease.

A *Hydrocele* with thickened fibro-cartilaginous or calcareous walls is most easily mistaken for malignant disease. The diagnosis must be made by incision and not puncture. If hydrocele is found, its walls can be excised; if malignant disease, the testis can be removed.

Chronic Orchitis is as a rule more chronic and indolent than new growth; the epididymis is more readily distinguished in orchitis, and the enlargement is never so great as in malignant disease. Large doses of potassium iodide, combined with mercury and locally strapping the testis, will usually cause a diminution in the size of the syphilitic testis; if this does not take place rapidly, an exploratory incision should be undertaken.

Tuberculous Testis.—In some cases where the body is affected, and there is much fibrous thickening of the tunica albuginea and vaginalis, the diagnosis may be extremely difficult; if the testis is removed for malignant disease, it is not a matter of much importance.

Results.—Twenty-seven of the fifty-seven cases could not be traced after the removal of the testis, and out of the remaining thirty-six eight were alive some time after the operation. Of these eight cases seven were solid growths, and one cystic. Though every effort was made to trace the cases, only two patients were known to be alive three years after the operation. Twenty-seven of the thirty-six had recurrence of the growth. Of the eight alive some time after operation, in four the time that had elapsed was not sufficient to state that they were cured, as they may succumb to a recurrence. All the seven cases of fibro-cystic disease were traced, and they all died except one. The general conclusion is that malignant disease of the testis is a very fatal malady.

Treatment.—Remove the organ as soon as the diagnosis is made. This should be done even if the lumbar glands are enlarged, for the patient is relieved of an incumbrance, and the danger of fungating growth will be avoided ; death from internal growth is preferable to death from a local recurrence, and among these cases there were only three where local recurrence took place. Operation is contra-indicated in cases of advanced disease in which there is a large lumbar swelling or evidence of secondary infection of other organs, as death will soon close the scene. If the cord is infiltrated, removal is useless, as the growth will fungate through the wound, and there may be serious difficulty in stopping the hæmorrhage at the time of operation.

In one case Roberts[2] made an attempt to remove the local recurrence and the lumbar lymph-glands ; the operation was difficult, and the patient died some days later. Whether removal of the lumbar glands as well as the primary growth will become in the future a successful operation is doubtful.

References.—[1]*Pract.* Dec. 1907 ; [2]*Ann. Surg.* 1902.

TETANUS. *Purves Stewart, M.D.*

The value of treatment by **Tetanus Antitoxin** is now established by the experience of numerous observers in a large number of cases. This method of treatment was discussed in the *Medical Annual* of 1905, and need not here be recapitulated. It may happen, however, that tetanus antitoxin is not obtainable, and under these circumstances it is well to bear in mind the successful results obtained by Italian observers employing Baccelli's **Carbolic Acid** treatment. Carbolic acid appears to have a specific action as an antidote to the tetanus toxin, attacking it in the circulation, combining with it to form an innocuous product, and being eliminated by the urine without causing nephritis or other untoward effects. Baccelli and his pupils employ a 5 per cent aqueous solution of carbolic acid, of which 1 cc. is injected hypodermically every two hours, or even more frequently, for many successive days. The treatment is supplemented by **Isolation** in a quiet room, prolonged **Hot Baths, Over-feeding,** and **Paraldehyde** or other suitable hypnotic. Amongst recent cases recorded in Italy may be mentioned five cases treated by Ricci,[1] of which four were cured, after a course lasting from fifteen to twenty-six days ; the fifth case was an acute one occurring four days after the infection in a feeble old man of 70, who died on the sixth day of treatment from heart failure. Bianchi[2] gives an extended account of a severe case beginning eight days after a wound on the hand ; treatment was begun on the third day of the disease, 60 cgrams being injected during the first twenty-four hours, then on successive days a total of one gram, 90 cgrams, 80 cgrams (for two days), 70 cgrams (for two days), 90 cgrams (four days), 80 cgrams (two days), 70 cgrams (a week), and so on down to 60 cgrams, and then omitting it, but increasing the amount again to 60 cgrams for a few days when the patient had a relapse. Ultimately,

after two months of treatment, the patient was discharged cured. Similar successful cases have also been recorded by Magi[3] and by Bonon.[4] In several of the above, it was noticed that when the carbolic acid injections were interrupted, the tetanic symptoms reappeared and were at once relieved by resuming the treatment. The value of this method seems unquestionable, and it should be borne in mind as a useful accessory to antitoxin medication.

References.—[1]*Il Policl.* 1908, fasc. xxxv. p. 1103; [2]*Ibid.* p. 1106; [3]*Ibid.* p. 1110; [4]*Ibid.* p. 1111.

THORACIC DUCT, SURGERY OF. *Priestley Leech, M.D., F.R.C.S.*

W. J. Stuart,[1] of Edinburgh, has collected forty-two cases of operative injury of the thoracic duct. This injury is regarded as very fatal, whereas, as a matter of fact, the mortality, apart from that necessarily associated with the accompanying operation, is not great. There are a few recorded cases of non-operative traumatic injury of the duct due to such causes as a stab, bullet wound, or fracture of the vertebral column. The diseases for which the operation was performed where the injury to the duct occurred are as follows: Tuberculous glands 16 cases, malignant disease 20, tumours of neck (nature not stated) 2, enlarged glands (nature not stated) 1; no details 1. Two cases were omitted because Stuart had not access to the records of them. In 26 of the cases the injury to the thoracic duct was recognized; in 13 the injury was not recognized, and about one no details were given. In 14 there was no subsequent chylorrhœa: in 2 a subcutaneous accumulation was reabsorbed later; in 16 pressure or packing arrested it; in 4 further operation (ligature, etc.) checked it, and in 3 the flow continued until death. The injury may be recognized at the time of operation by the escape of milky fluid, or clear fluid in which white threads are mingled. After the operation there may be a subcutaneous accumulation which when let out may be mistaken for pus: the dressings may be soaked either a few hours or several days after operation. Accumulation of chyle in a wound, or a constant discharge of chyle from it is *not* accompanied by any local inflammatory signs or any feverish symptoms provided sepsis is prevented. If the loss of chyle continues, it produces in most instances a very definite train of symptoms: emaciation is rapid and progressive, accompanied by general lassitude and dejection, feebleness, pallor, great thirst, scantiness of urine, and sometimes tachycardia, headache, giddiness and syncope, and there is constant hunger. The mortality really due to the chyluria should be placed at three cases, or 7·5 per cent.

A consideration of the cases shows that ligature of the wounded duct is an extremely safe and satisfactory procedure. Ligature of the peripheral end is sufficient: forcipressure has been tried three times, and suture in three cases. Packing has been only moderately successful. Supraclavicular pressure has been used in two cases of subcutaneous effusion without external discharge, and in both it

slowly disappeared. Implantation of the peripheral end of the thoracic duct into the internal jugular vein has been tried.

The duct is probably more often wounded than is imagined, as pieces of tissue may be clamped before division, and then ligatured, and thus if the duct were wounded no escape of chyle would ensue owing to the ligature.

De Forest[2] also writes on this subject.

References.—[1]*Edin. Med. Jour.* Oct. 1908 ; [2]*Ann. Surg.* Nov. 1907.

THYROIDECTOMY. *Priestley Leech, M.D., F.R.C.S.*

Berry[1] analyzes a further series of 274 cases of removal of goitre by operation ; this is a direct continuation of a former series published in 1901,[2] the total number in both series amounting to 400. It is only in a minority of cases of goitre that operative interference is demanded or permissible. The chief reasons for operation were as follows : dyspnœa in more than half the cases ; discomfort or deformity, mostly with minor degrees of dyspnœa ; malignancy, papilliferous tumour 10 cases ; suspected malignancy 3 ; dysphagia 1 ; increasing size 3 ; total 274 cases. He has never refused to operate upon any case of non-malignant goitre on account of the severity of the dyspnœa. The dyspnœa of innocent goitre is, in his opinion, always due to direct pressure on the trachea. As regards deformity it is only in the case of young people and for encapsuled tumours that operation should be undertaken on the ground of deformity alone. Dysphagia is rarely a prominent symptom, although its early occurrence is frequently a very valuable indication of malignancy ; it may, however, be a marked feature of the somewhat rare cases in which a small cyst or adenoma develops at the inner and back part of a lateral lobe. The nature of the goitre in the various cases was as follows :—Encapsuled tumours : solid adenoma 106 cases ; cystic adenoma 94 ; pure cyst 2 ; hydatid cyst 1 ; total 203. Non-encapsuled tumours : parenchymatous 26 cases ; adeno-parenchymatous 28 ; papilliferous 10 ; malignant 7 ; total 71. From the point of view of operation it is extremely important to differentiate between cases of encapsuled tumour (cystic or solid), and those in which there is a more or less general enlargement of the whole gland (the parenchymatous or adeno-parenchymatous goitres). The former as a rule are best dealt with by some kind of intraglandular enucleation ; the latter require the extracapsular operation of extirpation, or some modification of this.

Hæmorrhage into thyroid cysts and into the softer forms of adenoma is extremely common, and is probably the commonest cause of sudden dyspnœa in a unilateral goitre. If the adenoma or cyst is already the cause of considerable dyspnœa, a sudden increase in size from hæmorrhage may easily lead to most alarming, and in some cases even rapidly fatal, dyspnœa. The most dangerous of all goitres is the rapidly growing bilateral goitre of young people situated quite low down behind the sternum ; in such cases the trachea is apt to be flattened, there is marked stridor, and if they do not yield very quickly to medicinal

measures, they should always be submitted to operation. Among the most satisfactory cases are those where the bulk of the goitre is in the thorax—the intrathoracic goitres. The upper opening of the thorax is a hard, bony, unyielding ring, which permits of no expansion of the goitre outwards; all the pressure of an expanding goitre is therefore directed against the trachea and other soft structures. In elderly people there is often a history that the goitre has been getting smaller while the asthma (dyspnœa) has been getting worse; this means that the goitre is descending into the thorax.

Operation.—This depends on the nature of the tumour. When an encapsuled tumour is present the operation of choice is intra-glandular **Enucleation**: when it is a more or less glandular enlargement, the extra-glandular operation must be done. Where there are numerous small encapsuled tumours present in a parenchymatous goitre, **Extirpation** is usually to be preferred. The largest number of encapsuled tumours that Berry has enucleated at one operation has been six. It is important to bear in mind that however large an encapsuled tumour is, it is always covered by a more or less expanded layer of gland substance; the region of safety is inside this glandular capsule, and not outside. The tumour can usually be recognized by its colour, which is different from the maroon-red colour of the goitre.

Berry employs what he calls **Resection-enucleation** for large encapsuled tumours. After exposure of a lateral lobe it is dislocated forwards (if possible), and an incision is made through the glandular capsule till the tumour is reached: this is then enucleated on its inner and posterior aspects, the glandular tissue is again divided, and the tumour is removed, along with the thinned, atrophied, and useless layer of gland covering it. After removal of the tumour the cut edges of the gland are usually drawn together and united by sutures so as to diminish the bleeding area as much as possible.

In **Resection-extirpation** the knife is boldly carried through the gland, and the portion near the œsophagus and trachea is left behind. This procedure avoids the danger of cutting the recurrent laryngeal nerve, leaves enough gland tissue behind to carry on the functions of the gland, and fills up the unsightly hollow that might be left in the patient's neck.

The Anæsthetic.—In five cases only of this series was a general anæsthetic dispensed with. The anæsthetic should always be administered in the room in which the operation is done, and not in a side room. The preparatory dressing on the neck should be loosened, and the operator should be ready to begin the operation instantly should respiratory difficulties arise. In nearly all his cases chloroform has been the anæsthetic employed, sometimes combined with ether. Deep anæsthesia is dangerous. It is enough if the patient is insensible to pain, and especially to the pain of the first incision; a minimum of the anæsthetic should be employed. Often not more than two or three drachms of chloroform have been used during the whole of the operation. Towards the end, and before the wound is closed, the anæsthesia

should be so light that at a given signal the patient can be made to retch and strain, and thus test the efficacy of the hæmostasis. The chief danger of a thyroid operation is *post-operative venous hæmorrhage.*

The patient is best in a position of semi-recumbency, with the head thrown back as far as the anæsthetist will permit. Occasionally the operation has to be performed with the patient sitting upright.

The incision usually employed by Berry is a curved transverse one in the situation usually occupied by a necklace. Skin and platysma are dissected up, and some division of the infrahyoid muscles is generally made high up in the neck. It is important that the wound should be kept covered with moist gauze during the operation, to prevent infection. Rubber gloves should be worn by the operator and all assistants. Berry uses drainage more and more ; his usual practice now is one, or occasionally two, rubber tubes over the episternal notch (to be removed except in rare cases in eighteen or twenty-four hours), and insertion of a thin strip of sterile gauze for another twenty-four hours.

Neither cachexia strumipriva nor tetany has occurred in any case. Malignant disease of the thyroid is but rarely seen at a period when it is suitable for operation, and the results of operation are most unsatisfactory. Berry operated on only seven cases out of a large number which he saw. No cases of genuine exophthalmic goitre have been operated on. The list, however, includes ten cases of goitre with palpitation, tremulousness, and other symptoms often found with simple goitre as with Graves' disease. These cases are frequently classed as incomplete cases of Graves' disease, the so-called "*formes frustes :*" and operation in these cases often yields excellent results. The operation in true cases of Graves' disease is very serious, and the ultimate benefits are doubtful.

Monnier[3] gives the results of 670 thyroid operations. Patients as a rule came on account of dyspnœa ; in 130 suffocation phenomena had occurred ; and in 25 per cent cardiac disturbances were present. In urgency operations for suffocation the prognosis is very bad—seven deaths and thirteen recoveries ; the mortality apart from urgency operations is 1·3 per cent.

Delore and Chalier[4] say that general anæsthesia by chloroform or ether may be used in most cases of thyroidectomy, but that the anæsthesia must be light. They regard hæmorrhage into a previous existing cyst as by no means an infrequent occurrence, and it may be a cause of suppuration. In cases where a cyst has suppurated they think enucleation of the suppurating focus is the best treatment.

References.—[1]*Lancet*, Nov. 16, 1907 ; [2]*Ibid*, Feb. 1901 ; [3]*Beitr. z. klin. Chir.* Bd. liv. p. 23 ; [4]*Rev. de Chir.* Oct. 10, 1907.

TIC DOULOUREUX. (*See also* NEURALGIA.) *Purves Stewart, M.D.*

The inveterate character of this appalling malady has taxed the ingenuity of countless physicians and surgeons for its relief. The analgesic drugs which have from time to time been employed are innumerable ; various operations have been devised, such as division

or avulsion of the affected branches of the trigeminal nerve, and as a last resort the Gasserian ganglion has been extirpated, preferably by the intracranial route of Hartley and Krause. This latter operation is a formidable one, with a considerable mortality—Krause himself admits 7 per cent of fatal cases,—and though in most cases it permanently relieves the pain, yet recurrence of pain even after gasserectomy is not unknown; the explanation may probably be found in a regeneration of the divided nerve-fibres. Moreover, excision of the Gasserian ganglion produces many undesirable effects—sensory, motor, and trophic—in the territory of the trigeminal nerve, in addition to the inevitable deformity produced by the operation itself. Any method of treatment, therefore, which offers an equal prospect of cure with gasserectomy, and which is devoid of some of its disadvantages, is worthy of serious consideration, more especially if it can be carried out without danger or deformity.

Schlösser,[1] of Munich, a short time ago devised a method of attacking the affected divisions of the trigeminal nerve by **Alcohol Injections** into the nerves at their foramina of exit from the base of the skull. According to his observations, the injection of 1 or 2 cc. of an 80 per cent solution of alcohol produces, after a short period of pain, complete anæsthesia in the affected nerve area, which anæsthesia passes off after five or six days. Yet, though cutaneous sensibility returns, the neuralgic pain does not reappear, and relief is obtained for prolonged periods of time. Moreover, the injection can be repeated on several occasions with equally good results. A sufficiently large number of cases have now been treated in this way by various observers to enable us to judge of its value. Some, such as Kiliani,[2] have employed simply an 80 per cent solution of alcohol; others, such as Patrick and Hecht,[3] use the following solution:—

R	Cocainæ Hydrochlor.	gr j	Alcohol Absol.		℥iij
	Chloroformi	♏x	Aq. Dest.	ad	℥ss

Of this solution, as in Schlösser's original solution, 2 cc. are injected at a time. I myself employ this solution, and with satisfactory results.

The *modus operandi*, as described by Levy and Baudouin,[4] is as follows: A strong needle, 10 cm. long and 1·5 mm. in diameter, is used, to which is fitted a stylet like a trocar, save that the needle is sharp and the stylet is blunt. The needle is marked in centimetres up to five, so that the operator may know at what depth the point is. In performing the puncture the stylet is withdrawn slightly, so that the skin is pierced by the sharp point of the needle. When the point is well through the skin, the stylet is pushed in, so that its end projects from the needle-point; thus the remainder of the penetration is done with a blunt instrument, and injury of the deep vessels is avoided. At the proper depth, when the needle has reached the foramen in the skull, the stylet is withdrawn, the syringe, ready filled with the solution, is fitted to the needle, and the injection is slowly made. The needle

is allowed to remain *in situ* for a couple of minutes, to prevent bleeding: if any hæmorrhage occurs it is controlled by a few minutes' pressure. When the injection is successfully made into the trunk of the nerve, a burning pain occurs, followed by a sense of pressure or tension, in the area of distribution of the nerve. This is succeeded, if alcohol is alone used, by two or three hours' severe pain, followed by anæsthesia as above described. If cocaine be added to the solution, the pain is very slight. Sometimes there is diffuse headache. Slight œdema of the eyelids on the affected side may follow an injection into the upper or middle divisions of the nerve, whilst, after injection into the third division, there may be slight trismus in the masseter and pterygoid muscles. In addition, injection into the second division sometimes causes a slight paresis of the facial muscles, due, perhaps, as Kiliani suggests, to the connection between the spheno-palatine ganglion and the facial nerve. This facial weakness passes off within from three to fourteen days.

To reach the foramen ovale, through which the third division of the nerve emerges from the skull, the needle is inserted through the cheek behind the last upper molar, at the lower border of the zygoma, 2½ cm. in front of its descending root (which is always palpable, almost coinciding with the anterior border of the external auditory meatus). The index finger of the operator's left hand may be inserted into the mouth behind the last molar, as a guide, though this is not essential. The blunted needle is now pushed through the deep tissues (comprising the masseter and the posterior part of the temporal muscle) backwards and slightly upwards, till it impinges on the periosteum of the external pterygoid plate. It is then pushed on, under the periosteum, upwards and backwards until the base of the pterygoid is reached. It is now pushed backwards and more upwards until it enters the foramen ovale, at a depth usually of about 4 cm. The stylet is then withdrawn and the injection made. An occasional difficulty, to which other observers do not refer, but which I myself have met with, occurs in edentulous subjects, where the whole mandible is displaced upwards so that the upper part of the ramus and coronoid process is overlapped by the zygoma, thereby preventing the needle from reaching the deeper structures. This difficulty is overcome by making the patient open the mouth widely.

To reach the foramen rotundum, through which the second division emerges, is less difficult. We take as our guide the posterior border of the orbital process of the malar bone, prolong this line to the lower border of the zygoma, and insert the needle ½ cm. posterior to this point. Pushing horizontally inwards, and directing the point slightly upwards, the foramen rotundum is reached in the floor of the pterygo-maxillary fossa at a depth of about 5 cm., at a level with the inferior extremity of the nasal bones. The structures traversed by the needle include the anterior fibres of the masseter and the anterior edge of the temporal tendon, though this latter may be avoided if the patient opens the mouth.

The supra-orbital division, emerging through the sphenoidal fissure, is more difficult to reach with safety, owing to the proximity of the optic nerve and of the third, fourth, and sixth nerves. According to Patrick and Hecht the nerve is more often missed than reached by the needle: but though it is desirable to reach the nerve trunk, it is not essential, since alcohol injected near the nerve diffuses so as to reach it. The needle is inserted into the orbit just at its outer margin, close within the fronto-malar articulation, and is passed along the outer wall of the orbit to a depth of $3\frac{1}{2}$ or 4 cm.

The first injection in Kiliani's cases is followed by a second after twenty-four hours, a third on the third day, and sometimes a fourth a few days later. Patrick and Hecht, using cocaine and alcohol, make the second injection after five to seven days, if the first injection has produced freedom from pain; otherwise the second injection may have to be done sooner.

How long the relief from pain will last cannot be foretold with certainty. Six to twelve months' respite may as a rule be expected; sometimes two years' relief is obtained. Then the injections can be repeated. Each relapse is milder than the previous attacks, and ultimately the paroxysms may disappear.

In Schlösser's[5] 123 cases, the average period of relief by this method was 10·2 months. Kiliani records a series of fifty cases treated with alcohol injections. The neuralgia had been established for periods varying from six months to twenty years. Men outnumbered women in the proportion of thirty-five to twenty. The majority of patients were between forty and sixty years of age, only three being below forty years. In four cases the Gasserian ganglion had already been removed by the Krause-Hartley method, and one patient had undergone as many as seven previous operations. Out of his fifty-five cases, all were successful save three, of whom two appeared to be hysterical women, in whom the "failure" was questionable.

G. A. Wright[6] has recorded two cases of trigeminal neuralgia where benefit was obtained by the injection of a 2 per cent solution of **Osmic Acid** into the foramen rotundum and foramen ovale. He resected the zygoma and turned up the coronoid process of the mandible in order to gain access to the foramina. This seems a distinct disadvantage when equally good results are obtainable by inserting a needle through the skin. Of course, the local injection of osmic acid into peripheral branches of the trigeminal nerve has been practised for some years by physicians, and with encouraging results in the form of relief for more or less prolonged periods.

REFERENCES.—[1]*Berl. klin. Woch.* 1906, No. 3; [2]*Med. Rec.* Jan. 18, 1908; [3]*Jour. Amer. Med. Assoc.* Nov. 9, 1907; [4]*Presse Méd.* Feb. 17, 1906; [5]*Centr. f. inn. Med.* May 18, 1907; [6]*Lancet*, Dec. 7, 1907.

TINEA.—For varieties of tinea found in the Tropics, see article SKIN DISEASES (TROPICAL).

TOBACCO AMBLYOPIA. (*See* EYE, DIAGNOSTIC METHODS.)

TONGUE, CANCER OF. *Priestley Leech, M.D., F.R.C.S.*

Paul,[1] of Liverpool, gives his experience of Butlin's operation for this disease during the last three years. He thinks that no hesitation should be shown in these cases of following out Mr. Butlin's advice to remove the lymphatic areas of both sides of the neck. During the last three years he has operated on thirty-five cases of cancer of the mouth, many of them bad ones; of these two died, both from sepsis. He thinks that the injection of a dose of polyvalent serum before operation gives excellent results in those patients likely to run a serious risk of sepsis. He has classified the cases as follows:—

Favourable cases: 11. Free from recurrence 9; died from operation 1; no report 1.

Advanced cases: 15. Free from recurrence 8; recurred 1; died from disease 5; no report 1.

Bone cases: known to be free from recurrence 0; have recurrence 4; died from operation 1; died from the disease 2; no report 2.

Totals: Free 17; recurred 5; died of the disease 7; died of operation 2; no subsequent report 4.

With regard to the primary operation, he thinks only the most favourable cases can be dealt with through the mouth, and he is inclined to advocate in other cases a return to Kocher's and Syme's incisions, involving of course the clearance of the submental and submaxillary areas at the time of the primary operation, but leaving the carotid area and the posterior triangle for a subsequent operation.

A. Fells,[2] in remarks on 209 cases of operation for cancer of the mouth in Southern India, says that while cancer in most sites is certainly less common in Travancore than in England, it is much more frequent in the buccal cavity, and, contrary to what happens in England, the disease in Southern India begins in the hollow of the cheek just opposite the lower molar tooth. The explanation is probably that every native, high and low, male and female, chews, using a mixture of areca nut, betel leaf, tobacco, and slaked lime. The quid is scarcely ever out of the mouth except when eating, and every native retires to rest with it tucked in the cheek; and the favourite site for the cancer to originate is just the spot where the quid lies. There is a well-marked pre-cancerous stage, where the mucous membrane is thick and glossy; the epithelium readily strips, leaving a very vascular and resilient surface; sometimes it takes the form of leucoplakia. One other point of interest is that in most parts of Southern India buccal cancer does not appear to be as prevalent as it is on the south-west coast. The only explanation Fells can offer is that while in other parts plain dried tobacco leaf is used, in Travancore the shopkeeper steeps his tobacco in a thick black syrup prepared from a crude sugar, and then spreads the leaves on mats by the roadside to dry. By the time the leaf is used it is a black sticky mass, full of saccharomycetes and other low forms of vegetable life. There was a mortality of six out of the whole 209 cases. There were no subsequent lung complications, nor were there

any serious septic troubles, although the mouth was often in a septic state at the time of operation. He says that the administration of calcium chloride for a few days previous to operation was of distinct value in lessening the hæmorrhage from the wound.

REFERENCES.—[1]*Brit. Med. Jour.* June 6, 1908 ; [2]*Ibid.*

TONSIL, EXCISION OF. *Priestley Leech, M.D., F.R.C.S.*

H. Upcott[1] describes a method for excising the tonsil for malignant disease by which access can be easily secured to remove somewhat extensive disease and the glands at the same time. The various steps in the operation are as follows : (1) While the patient is being anæsthetized, inject $\frac{1}{100}$ gram of atropine subcutaneously. Perform tracheotomy or laryngotomy, and pack the pharynx and mouth with gauze. The tracheotomy or laryngotomy may be deferred to a later stage. (2) Curved incision from the mastoid process along the anterior border of the sternomastoid to the level of the thyroid cartilage. (3) Raise the patient's head, tilting the table to an angle of between 30 and 40 degrees. (4) Define and retract the sternomastoid, tie and divide the common facial vein. Open the carotid sheath at the level of the upper border of the thyroid cartilage, retract the internal jugular, and apply the clamp to the external carotid artery at its origin, tightening it until the pulsations of the vessel are controlled (Makins's spring intestinal clamp with the blades sheathed in thin rubber and the spring weakened does very well for an arterial clamp). (5) Clear away all visible lymph-glands and the submaxillary salivary gland, and ligate the facial vessels. (6) Define the posterior belly of the digastric and the posterior margin of the hyoglossus with the styloglossus passing over it. Retract the styloglossus downwards ; draw the posterior belly of the digastric with the great vessels backwards ; if the stylopharyngeus comes into view, it is also drawn backwards with the glossopharyngeal nerve. The superior and middle constrictors are now exposed in the floor of the wound. Carry the dissection upwards beneath the jaw, following along the internal pterygoid as far as possible. (7) Dry the wound thoroughly, and then pack it with gauze impregnated with vaseline. If tracheotomy has not been done before, it should now be performed and the pharynx plugged. (8) Drill the jaw in two places near its lower border just in front of the masseter. Saw through the jaw obliquely. (9) Draw the ascending ramus outwards, cutting the internal lateral ligament if necessary. Define the lingula with the finger, and pass a hook around the inferior dental nerve ; draw it from its canal and cut off. If the inferior dental artery is seen it should be secured. (10) Pass a finger into the mouth and place its tip against the anterior margin of the growth. Open the pharynx with the scissors in front of the finger. Continue the incision upwards and downwards until its ends are beyond the limits of the growth. Change the glove of the infected hand. Seize the divided edges with forceps and cut backwards from the ends of the incision until the growth can

be delivered into the wound ; draw it outwards and divide its posterior attachment. (11) Suture the pharynx with two layers of stout catgut, turning the edges in towards the throat. The first layer should be interrupted, commencing at the bottom, the ends of the stitches being left long in order to draw down the upper and more inaccessible parts of the wound. However large the wound, an attempt should be made to draw the edges together. (12) Take out the vaseline gauze packing, and remove the clamp from the carotid. Tie all bleeding vessels. (13) If any of the muscles of deglutition have been divided in the course of the operation, they may be sutured. Replace the ramus of the jaw and wire it in position. (14) Close the wound, leaving the upper part open for a large drainage tube, which must pass down to the pharyngeal suture line, and should be packed round with gauze. A smaller tube should be placed in the lower angle of the incision.

Reference.—[1]*Lancet*, Aug. 15, 1908.

TONSILS, DISEASES OF. *William Milligan, M.D.*
D. Lindley Sewell, M.B.

G. L. Richards recommends a form of tonsil forceps (*Fig.* 105) which he has designed to grasp the enlarged tonsil prior to its enucleation. The advantages he claims are : (1) That the jaw has considerable

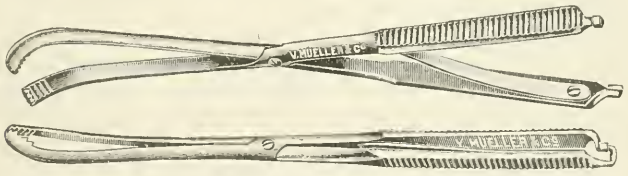

Fig. 105.—Richards' Tonsil Forceps, open and closed.

bearing surface, and will hold without tearing the tissue ; (2) That the handle will allow the ring of any tonsil instrument to be passed over it while *in situ* ; (3) That the lock is one which holds but which can at the same time be instantly released ; and (4) That the tonsil once grasped can be held by the instrument during the whole process of dissection.

TOOTHACHE.

(*Vol.* 1907, p. 35)—**Salimenthol**, a compound of salicylic acid and menthol, is given in 4-drop capsules as an analgesic.

TORTICOLLIS. (*See* Wry-neck.)

TRACHEA, DIRECT EXAMINATION OF. (*See* Laryngoscopy and Tracheobronchoscopy.)

TRACHOMA. (*See* Conjunctiva.)

TRYPANOSOMIASIS. *J. W. W. Stephens, M.D.*

R. Boyce[1] states that when an infective organism, such as a protozoon, shows two distinct phases in its life history, these two phases ought to be attacked by separate drugs, and it is not only possible but probable that a drug which affects the first will not affect the second, and *vice versa*. It is believed by some observers that two phases exist in the life history of trypanosomes, and consequently that it is advisable to treat with two drugs. In the case of animals inoculated with *T. brucei* (Ngana) atoxyl was first used, and then, when the trypanosomes had disappeared from the blood, corrosive sublimate. The results showed that while all the rats treated with atoxyl alone died, nearly 70 per cent of the rats given the "*double treatment*" survived, never showing any recurrence of trypanosomes, and of the remaining 30 per cent, only 8 per cent showed recurrences.

M. L. Martin[2] treats cases of human trypanosomiasis in the following way. **Atoxyl** 0·5 gram is injected every five days. When improvement is established, the dose is decreased and the injection given every six days. The treatment should last at least six months. In several cases there was added **Trisulphide of Arsenic,** washed and absolutely pure, 0·01 gram, in the form of a pill. Three pills are given in the interval between two injections of atoxyl: then after five days, six pills, increasing in this way up to twelve pills, and again diminishing to the original dose. The patients were well at the time of record. Eye symptoms should be watched for.

A. Laveran and A. Thiroux,[3] in experiments made upon guinea-pigs infected with *T. brucei*, which atoxyl alone is unable to cure, obtained a cure in all cases by combining atoxyl and arsenic trisulphide. The latter drug is used in a colloidal form for subcutaneous injections, or as a pill internally. They recommend the trial of this combined treatment in sleeping sickness.

A. Castellani[4] finds that **Quinine Cacodylate** has a well-marked trypanocidal action on a trypanosome closely resembling *T. evansi* (Surra). He suggests, therefore, the use of this drug, 0·10 gram subcutaneously, or better, in combination with intravenous injections of **Perchloride of Mercury,** according to Baccelli's formula—mercury perchloride 0·10 gram, sodium chloride 0·80 gram, sterile water 100 cc.—in the treatment of sleeping sickness.

O. Goebel[5] confirms the observation that human serum has an important influence on the experimental infection of *mice* with *T. brucei*. As a preventive its efficacy is certain, but its curative action is less. The preventive action in the case of guinea-pigs is less.

R. Koch[6] recommends **Atoxyl** in ½-gram doses (subcutaneously) on two consecutive days every tenth day. One-gram doses are dangerous, as they occasionally produce blindness. The treatment must be commenced as *early as possible*, and for detecting early cases the author states that it would be a mistake to rely solely on gland palpation, as trypanosomes may be found in the blood while the glands are not yet enlarged. (For the detection the author advises the making of the

blood-films as thick as possible, and then examining the stained specimens very carefully, several times if necessary.) The duration of the treatment should be at least four months, and then it must be determined by repeated examination that the blood is really free from trypanosomes. The patients should be kept in segregation camps for at least a year—two if possible. These segregation camps should be in places free from glossinæ. Besides the removal and treatment of the sick, in areas where a scattered population lives amidst glossinæ, the simplest means is the removal of the population to a glossina-free district. The expulsion of flies by cutting the bush should be adopted wherever practicable. Another means of attacking the fly lies in attacking their source of food. For instance, on the banks of Victoria Nyanza glossinæ live almost entirely on crocodiles' blood, so that the destruction of crocodiles (or rather their eggs) would interfere with their food supply, and so presumably tend to decrease of the flies, as they require blood every two or three days. The author also records cases where wives had contracted sleeping sickness through sexual intercourse with their husbands infected elsewhere. It was not possible in this case for tsetse (*Gl. palpalis*) to have spread the disease, as they were absent. Further, if other flies, e.g., *Stonoxys sp.* or ticks, which were abundant, had been capable of spreading the disease, then other (unmarried) women, children, and others would have contracted it, but the disease was confined to the wives of those who had been infected elsewhere.

J. L. Todd,[7] as the result of an enquiry into the subsequent history of cases seen by himself in Africa, states that: (1) The average duration of a case of sleeping sickness after signs of sleep have commenced is one to four months; (2) Of well-advanced cases with no signs of sleep, three to six months; (3) Of cases with indefinite symptoms, twelve months; and (4) Of patients apparently healthy, forty or more months.

A. Broden and J. Rodhain[8] give their experiences in the use of **Antimony Salts** in the treatment of human trypanosomiasis. They consider that they are an important addition to the use of arsenic salts. Schlippe's salt ($SbS_4Na_3 + 9H_2O$) has no advantage over tartar emetic. A dose of $\frac{1}{10}$ gram of this latter salt *intravenously* causes the trypanosomes to disappear *in a few minutes* from the blood and lymphatic glands, while 1 gram of atoxyl produces the same result only in about five hours. Relapses unfortunately occur in the majority of cases, the trypanosomes first appearing in the blood. For the detection of trypanosomes in the blood, the authors examine whenever there is the least rise of temperature in thick *fresh* films. For the examination of lymphatic glands they recommend puncturing the gland with a dry cannula, moving it about at different levels, and after withdrawal, squirting out on to a slide, by means of a dry syringe, the fluid which ascends the cannula by capillarity.

REFERENCES.—[1]*Brit. Med. Jour.* Sept. 14, 1908; [2]*Sem. Méd.* Feb. 5, 1908 [3]*Bull. de la Soc. de Path. Exotique*, Jan. 22, 1908; [4]*Brit. Med. Jour.* Feb. 29, 1908; [5]*Ann. de l'Inst. Pasteur*, Nov. 1907, in *Brit. Med. Jour.* June 11, 1908; [6]*Berl. klin. Woch.* Nov. 25, 1907; [7]*Montreal Med. Jour.* July, 1908; [8]*Arch. f. Schiffs u. Trop. Hyg.* 1908, No. 14.

TSETSE-FLIES. *J. W. W. Stephens, M.D.*

Zupitza[1] gives the following particulars as to the habits of tsetse flies (*Gl. palpalis*) in Duala (Cameroons):—(1) It is numerous in the forest and creeks. (2) The males and young females not engaged in depositing larvæ frequent especially small marshes, streams, and creeks where some sun penetrates. In these places they do not bite much. (3) To bite they fly out into the open. (4) They do not bite during rain, mist, or in the early hours of the morning. When the sun gets higher, and especially in hot weather, they bite keenly. In the later hours of the afternoon they are most voracious. (5) Their flight over open land extends to 300 metres. (6) They enter houses and bite therein. (7) Their chief food is man, domestic animals, monkeys, and small mammals, crocodiles, lizards, and small fish (*Periophthalmus sp.*), in the creeks only occasionally. Tortoises and birds are not attacked. (8) The pupæ are found on trees of all kinds, from some inches to some feet above the ground, in humus, layers of moss in the forks of the branches, clefts in the bark, etc. They occur frequently on palms. (9) The chief measure against the fly is the destruction of all vegetation, so as to give an open space exceeding the flight of the fly.

One of the most important questions with regard to tsetse flies and trypanosomiasis is, Do the flies act as mechanical transmitters, or do the trypanosomes pass through a cycle in their body? G. Keysselitz and M. Mayer[2] have conducted experiments upon this question. Stuhlmann had previously found when using flies reared from pupæ, that when they (*Gl. fusca*) were fed upon an infected animal, they became infected to the extent of 80 per cent. The trypanosomes show various developmental stages, e.g., small trypanosomes occur in masses in the proboscis to be subsequently washed out by the saliva when the fly next bites. Koch also infected from 19 per cent to 27·2 per cent, by feeding pupæ-raised flies (*Gl. fusca* and *Gl. tachinoides*) on infected rats (*T. gambiense*). The authors, however, have got a different result when using flies caught in the bush. In this case only about 10 per cent became infected when feeding on infected animals, a proportion which is about the same as that observed in nature. They explain this remarkable difference by supposing that tsetse flies are *only once* during their life capable of being infected, viz., when they first suck the blood of an animal containing male or female forms. With further blood-sucking the trypanosomes taken in die. This supposition explains why it is that flies caught with blood in them show no developmental forms (unless indeed the blood happens to be that of the first act of suction) and consequently are unsuited for experimental purposes.

References.—[1]*Arch. f. Schiffs. u. Trop. Hyg.* 1908, No. 3; [2]*Ibid.* 1908, No. 16.

TSUTSUGAMUSHI (Japanese River Fever). *J. W. W. Stephens, M.D.*

P. M. Ashburn and C. F. Craig[1] contrast this fever with spotted or tick fever of Montana: (1) Both occur in limited areas along mountain streams. (2) The country is in each case subject to snowfall in winter

and the streams to floods. (3) Contagion is unknown in either disease. (4) Tsutsugamushi is due to the bite of a larval *Trombidium*, whose adult form is unknown. (5) Montana fever is due to the bite of a tick, *Dermacentor occidentalis*, usually the adult.

REFERENCE.—[1]*Bost. Med. and Surg. Jour.* May 14, 1908, in *N. Y. Med. Jour.* May 23, 1908.

TUBERCULOSIS, PULMONARY (General Treatment of).

Joseph J. Perkins, M.A., M.B., F.R.C.P.

The various efforts at specific treatment in tuberculosis having been described in separate articles elsewhere in the *Annual*, but little remains to add. A few points, however, are worthy of attention.

The value of exercise in promoting the cure of phthisis has been emphasized in the last few years by the studies of M. S. Paterson[1] at the Frimley Sanatorium. It is true, as R. W. Philip[2] has pointed out, that the beneficial effects of exercise are no new discovery. In fact, the idea dates at least as far back as Bodington, the pioneer of the sanatorium method, even if we do not allow the claims of still older writers. In the hands of Brehmer and his lineal successor, Walther, of Nordrach, the principle was actively employed and systematized by taking, as the guide to the amount of exercise from day to day, its effect on the patient's temperature. The form of exercise selected by them was almost exclusively walking, i.e., exercise of the lower limbs, no doubt from a lurking fear of the dangers that might follow if the upper limbs, with their direct traction on the thorax and the lungs, were called into play. Philip[2] and others, it is true, had seen the groundlessness of this fear in selected cases, and countenanced general work, but we may still allow Paterson the credit of utilizing manual labour as a system of exercise, and showing that even heavy manual work was possible and directly beneficial to the consumptive. As will be seen from his own account of his method, the principle has been, and needs to be, employed with the greatest care.

Rest.—On Paterson's system patients are kept absolutely at rest so long as the temperature reaches 99° for men, or 99·6° for women, even so small a rise during absolute rest indicating activity of the disease. After the temperature has been normal for a week or ten days the patient is allowed up for dinner, but returns to bed as soon as the meal is over. If the temperature remains unaffected by this exertion, the patient is allowed up for longer and longer periods, and light work with the fingers, e.g., sewing, making mats, etc., is undertaken, chiefly to provide occupation.

Exercise.—All being well after from ten to fourteen days of this treatment, the patient is allowed to walk half a mile a day for a week, and this amount is gradually increased till six to ten miles is being covered daily. The ability of the patient to perform this amount is based partly on his general condition, but chiefly on his temperature, excessive exercise being marked by a rise to 99°, usually accompanied by headache and general symptoms of malaise. The succeeding

grades of labour are, in order: (1) Carrying baskets of mould or other material; (2) Using a small shovel; (3) Using a large shovel; (4) Using a pickaxe—the work in all these grades being limited to four hours a day; (5) Using a pickaxe for six hours a day. Basket work is subdivided into three sections: in the first 12lb. being carried; in the second 18lb.; and in the third 24lb.; in each case for 50 yds. up an incline the total work for the day being respectively equal to a load of 8½cwt., 13cwt., 17½cwt. With the small shovel (grade 2) 2 tons of earth, increasing to 4 tons, is dug per diem, and raised 7ft; with the large shovel (grade 3) 6 tons. Pickaxe work is ordinary navvy work, and consists in breaking unbroken ground, excavating, etc.

For the full details of the minute precautions with which this system has been elaborated, and of the infinite care to which its success is due, the reader is referred to the original paper. It may be said, however, that a temperature of 99° is taken as the danger signal throughout, and the work at once reduced. Otherwise, if work is still persisted in, headache and general pains, the whole closely resembling an attack of influenza, a further rise of temperature, and possibly pleurisy will result. These symptoms are the result of auto-inoculation, as A. C. Inman[3] has shown in his suggestive and able effort to translate the system into terms of the opsonic index.

As regards the drug treatment of pulmonary tuberculosis, Philip[4] speaks favourably of **Creosote, Guaiacol,** and the carbonate of the latter in combination with **Arsenic** (guaiacol carbonate 4 gr., acid arsenios. $\frac{1}{60}$ gr., in pill, one to three thrice daily), but deprecates the frequent tendency to change treatment too often. For any benefit to accrue, a fair trial over a prolonged period is essential, and creosote must be given in reasonably large and increasing doses. Guaiacol may be given in cod-liver oil, or in sherry, or brought into solution with alcohol, and given in a mixture, e.g.:

R	Guaiacol	℥ iv	Ol. Cinnamon.	℥ j
	Alcohol (90%)	℥ xl	Aq.	ad ℥ j
	Glycerin	℥ xxx		(*Guy's Hospital.*)

The value of **Mercury** in pure tuberculosis, i.e., in cases where there is no reasonable suspicion of syphilis, is insisted on by Surgeon Lisle Wright[2]; for success, large and increasing doses are necessary, the tuberculous being extremely tolerant of the drug. The succinimide was the salt chosen and was administered by intramuscular injection.

Hæmoptysis.—An increasing body of support for the use of **Nitrite of Amyl** for hæmoptysis, first introduced by Francis Hare, finds expression (Tochi).[6] It should be reserved for emergencies, and its use supplemented by the more persistent nitrites, e.g., nitrite of sodium.

References.—[1]*Lancet*, Jan. 25, 1908; [2]*Ibid.* Feb. 1, 1908; [3]*Ibid.* Jan. 25, 1908; [4]*Folia Therap.* Oct. 1907; [5]*N. Y. Med. Jour.* May 23, 1908; [6]*Gaz. deg. Osped.* No. 11, 1908, in *Med. Rec.* May 16, 1908.

TUBERCULOSIS, SURGICAL. *Priestley Leech, M.D., F.R.C.S.*

The tendency in surgical tuberculosis not to interfere surgically unless absolutely obliged, has been still more marked during the past two years, and treatment by evacuation of and injection into abscesses, by Bier's congestion treatment, or by the injection of the various tuberculins, has become more fashionable. In some cases the results have been admirable, but it is yet too early to speak definitely as to the place these various methods will take in the armamentarium of the surgeon.

Calot,[1] of Berck-sur-Mer, in a lecture on the treatment of *Coxalgia*, says that the classical treatment of this disease by rest and immobilization of the joint, with general medical and climatic treatment, and tapping but not opening of abscesses, gives much better results than were formerly obtained, but that even in favourable cases the patient is often lame. He says that this can be avoided by injecting the following solution, which destroys the tuberculous fungosities that invade the bone :—

℞	Olive Oil			Creosote	℥ss
	Ether	āā ℥iss		Iodoform	℥j

The treatment may be employed within the first few weeks, or even three or four months after the disease has been clinically confirmed, as at this stage the bone is neither softened nor destroyed. Seven to ten weekly injections are necessary. The landmarks for penetrating the hip-joint are as follows: (1) A horizontal line passing through the spines of the pubis; and (2) The femoral artery as it passes under Poupart's ligament. A Collins' needle No. 2 or a fine trocar is inserted at a point 1¼ in. below the horizontal line and ¾ in. outside the femoral artery. In children from nine to twelve years of age the distances would be respectively 1 in. and ½ in. The syringe is inserted directly from before backwards, until the bone is felt, i.e., to a depth of 2 in. At this moment the limb is slightly flexed, abducted, and rotated externally, to facilitate the penetration of the liquid. At the end of two months (i.e., after nine or ten injections) compression of the articulation by means of cotton wadding with continued extension or plaster apparatus is applied for two or three months, but four or five months more are necessary before the patient can be allowed to get up, and then he is cured.

The same method is applied to the treatment of *Tuberculous Abscesses*. The pus is drawn off (if it begins to be blood-stained, stop), and the liquid is injected into the abscess cavity; the injections are repeated weekly for ten weeks; in the interval, compression is used to bring the walls of the cavity into contact with one another. The maximum dose is 20 grams for an adult and ½ gram for every year of the patient's age up to twenty years. If the abscess is not quite ready, an injection is given of glycerin 6, camphorated naphthol 1.

Ely and Whitbeck,[2] of New York, present a report of three years' work of the treatment of surgical tuberculosis by the **Sea-side** in the

hospital on the beach at Coney Island. From the start reliance has been placed upon two great therapeutic agents—fresh sea air and good food; everything else is subordinate to these. Only smaller operations were undertaken at the hospital; for serious operations the children were transferred to the city hospitals. To avoid mistakes in diagnosis, most of the earlier cases were seen by at least one other surgeon besides the attending surgeon. When the present staff first took up its work, it threw out a number of cases which had been regarded as tuberculous, and this had also been done by its predecessors. Severe, desperate, and practically hopeless cases have been admitted. One form of tuberculosis alone was barred, viz., pulmonary. The results cannot therefore be judged on a percentage basis of cure. The conclusions are: (1) The seashore is the best place for treating children with tuberculous adenitis; those with enlarged tonsils and adenoids should be submitted to an operation as a start of the cure. (2) The seashore is probably the best place for tuberculous joints, provided they can have there the same skilled orthopædic care as elsewhere; the disease runs a somewhat milder and probably a shorter course, and the functional results are better than those obtained elsewhere. (3) The results have been largely due to the careful attention (including feeding and nursing) which has been given the children. (4) The results justify pushing the work. (5) A hospital such as this does better work than a public hospital under control of the municipality. (6) Many cases of so-called bone tuberculosis are in reality syphilis. The histories of seventy-six cases out of eighty-two cases which have been in the hospital are given.

Hohmeier,[3] of Professor König's clinic, has treated fourteen cases of surgical tuberculosis with **Marmorek's Serum.** The serum was given by subcutaneous injections, and also per rectum after a cleansing enema. He has not observed any severe ill effects of the serum except skin rash; it may have hastened the cure in mild cases of surgical tuberculosis; in severe cases he has not seen that the serum has any influence at all, and in two cases its use did not prevent a recrudescence of quiescent tuberculous foci, and he could not be sure that the improvement in general health which had been ascribed to the action of the serum was in reality actually due to it.

Ridlon,[1] of Chicago, has studied the effects of Koch's **New Tuberculin** injected in chronic joint diseases after Wright's opsonic method; he reports the results of three months' treatment in ten cases. All the patients were better and had gained weight, except one; the sinuses had healed more rapidly, but the abscesses had developed more rapidly than he would have expected under routine treatment. A low tuberculo-opsonic index with local joint symptoms may be accepted as evidence of joint tuberculosis; if the index is normal, with joint symptoms, tuberculosis is neither proved nor disproved; if a diagnosis of joint tuberculosis has been made, a high index should be maintained, as an operation may be undertaken with a high index but not with a low one. If the use of the diseased joint causes a

lowering of the opsonic index, the joint must be immobilized and protected ; if the use of the joint does not lower the index, it may be permitted ; if it raises the index, it should be insisted upon.

Stansfield Collier[5] considers that the opsonic index in tuberculous disease is extremely valuable in guiding one to the indications for employing a vaccine, in gauging the dose, and in repeating it at suitable intervals. It appears that if sufficiently small doses are employed harm is unlikely to attend the use of tuberculin in tuberculosis ; and in cases where the effect upon the index has been watched for a month or two, frequent observations of the serum are not necessary. This treatment does not, however, remove caseous material, etc. Caseous glands should be removed, sepsis being avoided as far as possible. It is of much service in operation cases where there is much breaking down of gland tissue and infection of surrounding connective tissue ; and in cases treated by this method the brawny swelling, stretched scar, and persistent sinus have not been seen, though they were formerly common. It is better to operate where the index is low unless there is a negative phase.

With regard to the treatment of *Tuberculous Sinuses*, J. W. Lever[6] reports good results from the use of **Bier's Cupping-glasses** in such cases. In some, however, the patients seemed to be made worse. If the sinus is in a part such as the leg or arm, where an elastic bandage can be applied, this is also used.

Van Kaathoven[7] reports a case where Bier's treatment in a case of tuberculous arthritis of the knee apparently aggravated the condition.

The May, 1908, number of the *Practitioner* contains several articles on the opsonic method and vaccine therapy.

References.—[1]*Med. Press*, Mar. 25, 1908 ; [2]*Med. Rec.* Mar. 7, 1908 ; [3]*Münch. med. Woch.* Ap. 14, 1908 ; [4]*Chicago Med. Rec.* Nov. 1907, in *Med. Rec.* Dec. 14, 1907 ; [5]*Pract.* May, 1908 ; [6]*Bost. Med. and Surg. Jour.* June 6, 1906, in *Lancet*, Sept. 28, 1906 ; [7]*Ther. Gaz.* Mar. 15, 1908.

TUBERCULOSIS (Diagnosis and Treatment by Tuberculin).

Joseph J. Perkins, M.A., M.B., F.R.C.P.

Diagnosis.

It is unnecessary to insist on the need for a specific and infallible means of diagnosis for tuberculosis if it could be found. One has only to look, apart from phthisis, at the many obscure diseases of bone and joints ; and in phthisis itself tubercle bacilli only appear in the sputa after the disease has reached the stage of softening, in favourable cases often a late event. The physical signs in early stages may be vague and inconclusive ; for months symptoms of ill-health, suggestive of tuberculosis, are present before signs in the lungs appear at all—not to mention antecedent tuberculous conditions like pleurisy, which demand recognition and suitable treatment. At the same time, experience teaches us more and more that good results depend on the application of treatment at the earliest moment.

Such a means of diagnosis has been sought in the use of tuberculin, chiefly in one of three ways: (1) Subcutaneous injection (Koch); (2) The cutaneous method of Von Pirquet; (3) The conjunctival method of Wolfl-Eisner and Calmette.

1. **Koch's Own Method,** in which the diagnosis depends on a febrile reaction occurring after the injection of old tuberculin, has never made headway in this country, though it has been largely adopted elsewhere, and has proved invaluable for cattle. A usual dose is 0·5 mgram for an adult. The possibility of danger, the fever, the inconveniences of the method in the frequent observations of temperature required and the confinement to bed, and its inapplicability in febrile conditions, have all combined to oppose its use. Moreover, in late severe cases of phthisis and in general miliary tuberculosis (Shennan) no reaction is obtained. This disadvantage, however, it shares with the other methods to be described.

2. **Von Pirquet's Cutaneous Reaction.**—Tuberculin vaccinated into the skin produces a local reaction, in the shape of a papule, in those already tuberculous, owing to the presence of antibodies in the skin, the result of the previous infection.

Method.—The skin is lightly scarified on the inner aspect of the forearm at two spots, one to serve as a control, and a drop of tuberculin diluted with carbolic glycerin and sodium chloride placed on the one and the diluent without the tuberculin on the other. In twenty-four hours (early reaction) a hyperæmic papule surrounded by a bright red zone of the size of a florin forms. Vesicles develop on the papule which break and form a scab, resolution commencing about the fourth to the sixth day and being complete in eight or ten days. Pigmentation remains.

Von Pirquet himself uses a 25 per cent solution of tuberculin (Koch's old tuberculin 1 part, 5 per cent carbolic glycerin 1 part, 0·85 per cent sodium chloride 2 parts), but weaker and stronger solutions have been recommended by others. In scarifying there is no need to draw blood, and the tuberculin solution is allowed to remain in contact for several minutes, the skin being first washed with ether. The colour of the papule, a sharply defined margin to the zone of hyperæmia, and infiltration at the base of the papule, are distinctive points. According to Junker (Shennan) the papule must remain prominent till the fifth day. Besides the early reaction described, a late reaction (forty-eight hours) is seen, in older children chiefly. The control areas show slight congestion and swelling, passing off after twenty-four hours. In the scrofulous (bone and joint tuberculosis) and in tuberculosis of the skin, a very intense reaction follows. No general reaction should occur.

Investigating nearly 1000 cases, Von Pirquet found his reaction present in 88 per cent of the tuberculous and in 10 per cent of those clinically non-tuberculous. The latter were possibly largely to be accounted for by latent tuberculosis.

No reaction is obtained in the last days of life or in miliary tuberculosis, this disadvantage being shared with Koch's and Calmette's methods. At

first employed for children under one year, Von Pirquet, with increased study, has been able to apply it to older children and to adults. Hammerschmidt concludes that a negative result speaks with great probability against, and a positive one with still greater probability for tuberculosis.

3. **The Conjunctival Reaction (Ophthalmo-reaction)**, though commonly bearing the name of Calmette, really owes its origin to Wolff-Eisner, who was led to study the application of tuberculin to the conjunctiva from his observations on its hypersensitiveness to pollen in hay fever. He used a 10 per cent solution of old tuberculin (T.A.). Calmette, fearing that the glycerin and bouillon derivatives in the old tuberculin might prove irritating to the eye, precipitated the tuberculin with alcohol, dried it, and dissolved in distilled water or normal saline to form a 1 per cent solution. This fear has proved unfounded, and both forms of tuberculin, the old and Calmette's modification, are used.

In tuberculous subjects it is claimed that the instillation of a drop of such a solution is followed by conjunctivitis, whereas in the non-tuberculous no such effect results. This is believed to be due to hypersensitiveness of the cells which have been stimulated by the toxins of the tubercle bacilli till they are ready to produce an excess of antibodies in the presence of the tuberculin. These antibodies liberate endotoxins capable of setting up inflammatory changes in the conjunctiva, and thus give rise to the reaction (McHutchison.)

Method.—The lower lid is drawn down, while the patient is directed to look up, and a drop of the solution is allowed to fall into the lower sac. The lid is to be held down for half a minute, to ensure the distribution of the fluid, and care is taken that it does not escape through movement. It is well to note the appearances of the conjunctiva in both eyes, as the other eye is to be used as a control in estimating the presence and degree of the reaction.

Reaction.—In a few hours itching and smarting at the inner canthus, lacrymation, exudation, with redness and swelling of the conjunctiva, most noticeable at, and in some cases limited to, the semilunar fold and caruncle (Barney and Brooke), take place in successful results. The following table (Campbell, McKee and White) is of value in forming a conclusion :—

O—No difference in either conjunctiva.
?—Slight difference, especially in the caruncle.
+ Distinct redness of caruncle and palpebral conjunctiva.
+ + Distinct redness of palpebral and bulbar conjunctiva, with formation of fibrin.
+ + + Œdema of lids and photophobia (chemosis).

The symptoms of the reaction appear in three to twelve hours in most cases, but may be delayed twenty-four to forty-eight hours; they usually disappear in two, three, or four days, but in the severer cases may last a week.

Precautions.—Sharp inflammation having followed the use of too

large a drop even of the 1 per cent solution, a single drop of a half per cent solution (Comby) is now usually employed. The solution should be freshly prepared, though there is some doubt on this point. The patient should be cautioned not to rub the eye, which should not be exposed to wind or dust. In doubtful cases, where a second test is necessary, the other eye should always be employed, and not a second application made into the same eye. A stronger solution (1 per cent) may be used in that case.

Any existing disease of the eye, except errors of refraction, is to be regarded as a contraindication, and it is wiser to include old disease which has left traces in the same category; some would add hay fever and the administration of iodides (Mannheimer.)

Dangers.—While cases of severe and protracted inflammation are rare, so that some writers speak of ill results as negligible, such cases do occur (Harrison Butler)—the most intense conjunctivitis, chemosis, ulceration, and resulting nebulæ all having been reported—demanding active treatment and healing slowly. Erlanger considers it dangerous to start with a stronger solution than 1–10,000 in pre-existing ocular disease. The after-injection of tuberculin has been known to light up the inflammation. Little pain as a rule accompanies the conjunctivitis, even if well marked, and there is only exceptionally any trace of a general constitutional reaction.

Statistical Results.—Barney and Brooke, investigating 321 cases, including 250 cases of pulmonary tuberculosis and 61 in whom there was no reason to suspect tuberculosis, obtained a positive result in 6 of the latter, two of whom were, however, suffering from gonorrhœa, and one had recently recovered from typhoid fever, both diseases which, it will be seen later, give a reaction. The phthisical were divided into active; inactive but not arrested; arrested; apparently cured; giving positive percentages respectively of 97, 75, 40, and 23.

Audeoud, collecting 611 cases, found that a positive result was obtained in 95 per cent of the 261 obviously tuberculous cases, and in 8·3 per cent of 303 cases which presented no clinical symptoms of tuberculosis.

The reaction then fails to be present in some tuberculous cases, and appears in others not obviously tuberculous. As regards the first group, it is agreed that very advanced cases nearing death fail to react, and this failure is of very gloomy omen, the resisting power being exhausted; cases of general miliary tuberculosis and tuberculous meningitis also fail to react.

On the other side, typhoid and gonorrhœa (Serafini) react, as do some cases of rheumatism; the remaining positive results in the apparently non-tuberculous will in some proportion undoubtedly be due to the presence of unsuspected lesions. Some observers think the percentage of error well within the limits of this possibility; other (Parkes Weber) are led to speak doubtfully of the value of the test. Widal's test in typhoid, it is pointed out, is not infallible, yet no one doubts its value.

On the whole, those who support the test and hold its dangers lightly are in the majority. The possibility of serious inflammation of the eye should lead us to confine its use to patients strongly suspected of tuberculosis where other efforts to arrive at the truth have been unavailing; in them, with the exceptions given above, its verdict is truthful in more than 90 per cent of the cases.

Tuberculin as a Therapeutic Agent.

Recent years have witnessed a marked revulsion of feeling with regard to the therapeutic value of tuberculin. Utterly discredited on its introduction by the disastrous results which followed the large doses then employed, its undoubted potency prevented tuberculin from losing hold completely. With improved preparations and the better knowledge of the dosage which observation taught, it gradually regained favour, abroad, it is true, rather than in this country, though McCall Anderson, it should be remembered, never abandoned its use. The dose was gradually reduced and, no better results following the reaction produced by larger doses, the aim became to administer a "subminimal" (Trudeau) dose, i.e., one just short of the amount causing a reaction. Quite recently Wright's work has had an immense effect in placing tuberculin on its proper footing as a therapeutic agent. We have no reason to believe (Baldwin) that even in large doses, tuberculin produces mobilization of the bacilli; the work of Liebmann, who found tubercle bacilli in the blood after tuberculin injections, has never been verified, and Lawrason Brown holds it should be rejected on the ground of faulty technique.

The conditions for which tuberculin is advocated can be placed under two heads: (1) Local tuberculosis, e.g., of glands, joints, the genito-urinary tract; (2) Pulmonary tuberculosis.

1. As to its value in *local tuberculosis*, in doses, e.g., of $\frac{1}{5000}$ to $\frac{1}{2000}$ mgram T.R. or more in adults, there is such a complete consensus of opinion that no more need be said. Rivière considers $\frac{1}{12000}$ to $\frac{1}{8000}$ mgram an average suitable dose for a child of one year, $\frac{1}{4000}$ mgram for a child of five years, and $\frac{1}{3000}$ mgram for children of ten or twelve years.

2. The value of tuberculin in the treatment of *pulmonary tuberculosis* is a much more debatable point, though on the whole opinion leans distinctly in its favour. Of the many preparations available, Koch's T.R. is the one in general use; the old tuberculin is still used by some, and the bacillen-emulsion is well spoken of. Trudeau, who has had a larger experience of the use of tuberculin than perhaps any man, finds himself unable to pronounce definitely in favour of any one. In phthisis, especially in febrile conditions, doses are indicated much smaller than those given above for local tuberculosis, and it is well to start with a dose, say, as small as $\frac{1}{250000}$ mgram or even smaller, and increase, thus avoiding the production of unfavourable symptoms—pyrexia, headache, general malaise. The graduation of the dose by the opsonic index does not fall within the scope of this article. In any

case, the use of tuberculin is to be considered as an adjunct only in treatment, to be combined with the use of the ordinary hygienic and dietetic means.

Results.—The experience of Trudeau at the Saranac Sanatorium (Lawrason Brown) forms our largest body of accurate observation, and is especially valuable in that the after-histories of the patients for a considerable number of years has been carefully followed. During some twelve years, dating from 1890, 159 cases were treated with tuberculin, the dose used being such as to produce as little reaction as possible. The 159 included 43 cases of incipient phthisis, 104 of advanced, i.e., with well-marked disease of fairly extensive distribution, and 12 of far-advanced disease. The last group can be dismissed at once, treatment having been unavailing. At the same time the Sanatorium contained a large number of other patients who fell into the same classes: both groups, except for tuberculin, received the same general treatment. The following tables show the immediate results:—

INCIPIENT.

Total Cases	No.	Tuberculin Cases	No.
Apparently Cured	204 = 63 per cent.	Apparently Cured	31 = 72 per cent.
Arrested ..	85 = 26 per cent.	Arrested ..	9 = 21 per cent.
Improved ..	23 = 7 per cent.	Improved ..	2 = 5 per cent.
Unimproved ..	3 = 1 per cent.	Unimproved ..	1 = 2 per cent.
	325		43

ADVANCED.

Total Cases	No.	Tuberculin Cases	No.
Apparently Cured	103 = 13 per cent.	Apparently Cured	28 = 28 per cent.
Arrested ..	363 = 44 per cent.	Arrested ..	56 = 54 per cent.
Improved ..	218 = 27 per cent.	Improved ..	7 = 7 per cent.
Unimproved ..	103 = 13 per cent.	Unimproved ..	8 = 8 per cent.
	787		101

A slight but distinct advantage to the credit of tuberculin is to be noticed in each group. Further, the tuberculin-treated cases lost the bacilli from their sputa more readily and completely.

The true test of the value of any treatment is freedom from relapse after return to ordinary occupations: in this the advantage is on the side of the tuberculin, and to a far greater extent than on the immediate results. With each succeeding year, the number still living includes a greater percentage of those who had received tuberculin, so that a time is approaching when all the survivors of the earlier years of treatment will be found among them. A certain increased improvement while under treatment, and a marked freedom from relapse, result from the use of tuberculin.

Writing later, Brown adds that it unquestionably produces an antipyretic effect in many patients, and holds that it may be given to patients taking exercise; though he prefers less exercise on the day following the injection, he does not insist on absolute rest.

Von Ruck, tracing 602 patients who were under treatment from 1897 to the end of 1904, found that of 139 first stage cases 91·4 per cent had escaped relapse; of 265 second stage, 80·4 per cent; and of 198 third stage, 37·4 per cent.

On the other hand, Raw, while finding the results of T.R. excellent in tuberculous disease of bones, joints, glands, and the peritoneum, thinks that it has little or no beneficial effect on pulmonary tuberculosis. Working on the hypothesis that man is attacked by bacilli both of the bovine and human type, and that these generally speaking are antagonistic, he finds in this the explanation both of the success and the failure, Koch's T.R. being prepared from human bacilli. Tuberculosis of the peritoneum, bones, joints, and glands he believes to be due to bovine infection, and therefore amenable to T.R.; phthisis, tuberculous laryngitis, and enteritis are due to the human type of bacillus, and should therefore be treated by a bovine tuberculin such as he has prepared. He reports the treatment of sixteen cases of phthisis by this means, with excellent results

Latham, believing in the benefits of the treatment of phthisis by T.R., has proposed its administration by the mouth in preference to injection to avoid the reactive symptoms, which are more common by the latter method. The tuberculin is given either in normal horse serum (5 or 10 cc.) or in normal saline solution, and on an empty stomach, conveniently in the early hours of the morning, absorption taking place then but not after food. A little milk may be given at the time. The fact of absorption by this method is proved by the increase in the opsonic content of the blood.

Tuberculin has also been given per rectum with success, and in one of Latham's cases the temperature fell in tuberculous peritonitis after administration of tuberculin with horse serum per rectum, when administration by the mouth both in horse serum and normal saline had failed. He reports six cases of active and extensive phthisis treated by this means, in all of which the temperature fell to normal and improvement followed, one being a case of acute pneumonic tubercle. The doses used ranged from $\frac{1}{1000}$ to $\frac{1}{500}$ mgram. In the discussion which followed Latham's paper, Hector Mackenzie could quote an instance of successful treatment of tuberculous glands by tuberculin per os, but spoke with caution of the results in phthisis.

The use of tuberculin in pulmonary tuberculosis seems to be thoroughly rational when we consider that the good effects of graduated exercise or labour, the sheet anchor in the sanatorium treatment, are really due to auto-inoculation with tuberculin, as has been proved by Paterson and Inman. It is evidently of value in febrile stages as well as in afebrile, and has the peculiar power of converting the inverse type of temperature, which has always been held to indicate a miliary spread, to the normal type.

Marmorek's Serum.—The reports of the results obtained by treatment with Marmorek's serum are conflicting, but on the whole it must be concluded that it has failed to fulfil its early promise. The

favourable results have usually been seen in surgical tuberculosis (bones, joints, and glands), in which in the hands of some it has done well. In pulmonary tuberculosis it is of little avail. Köhler, trying it in sixty cases, could find no marked beneficial result. The cases, however, were evidently advanced ones and unsuitable for sanatorium treatment. As a rule, it was given per rectum in doses of 5 cc. Some improvement occurred in twenty-two cases, but in twenty the condition of the lungs became distinctly worse while under treatment. In seven cases hæmoptysis occurred, and this tendency to hæmorrhage has been noticed by others; while in some of the afebrile cases fever set in. The experience of Elsaesser was much the same.

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TUBERCULOSIS (Treatment by Béraneck's Tuberculin).

R. W. Philip, M.D., F.R.C.P.

My experience of this tuberculin extends over several years. It seems to me clear that it is effective, and, at the same time, less toxic than some other tuberculins.

The method of dilution which I prefer to follow differs somewhat from that recommended by Sahli.* It seems to me simpler and more practicable. Commencing with Béraneck's original liquid, that is, T $\frac{1}{20}$, a series of dilutions is made, each succeeding dilution being one-tenth as strong as the preceding one. Thus:—

TBk = Original Solution (T $\frac{1}{20}$)
TBk_1 = 1 : 10
TBk_2 = 1 : 100
TBk_3 = 1 : 1000
TBk_4 = 1 : 10,000
TBk_5 = 1 : 100,000
TBk_6 = 1 : 1,000,000

Vide Professor Béraneck's article, p. 64.

1. *In Non-pyrexic Cases*, treatment may be commenced with TBk_5, that is, 1–100,000. Of this $\frac{1}{10}$ cc. is injected under the skin of the thorax or elsewhere, the injections being conveniently made in the morning. If reaction occur (temperature, pulse, general or local disturbance), the next dose should be reduced to $\frac{1}{20}$ cc. of TBk_5, or the weaker solution—TBk_6—may be employed. If no reaction occur, the same dose is repeated on two or three occasions, at first at intervals of seven to ten days, and, later, it may be, at shorter intervals. Thereafter, succeeding injections may be increased by $\frac{1}{20}$ cc. until a dose of 1 cc. TBk_5 has been reached. If, at any point during increase of dosage, reaction occur, it is wise to wait until this has subsided before making further injection, and then a somewhat weaker dose should be given.

If 1 cc. TBk_5 be well tolerated on successive occasions, the next solution of the series, namely TBk_4, i.e., 1–10,000, may be employed. In using this, the same system of dosage is to be followed as with TBk_5, and the same precautions observed in gradually passing from $\frac{1}{10}$ cc. until 1 cc. TBk_4 is reached. If, after any injection, reaction occur, a rather longer interval should be allowed to elapse, and the next dose should be reduced. If the dose of 1 cc. TBk_4 be well tolerated on several successive occasions, the stronger solution, TBk_3, may be employed, with gradual advance as previously from $\frac{1}{10}$ cc. up to 1 cc. Similar procedure may be followed in respect of the stronger solutions.

It may not be necessary to pass through the entire series from TBk_6 to TBk_1. In every case, treatment must be adapted to the individual need, and dosage will vary correspondingly. The limit for each patient is the maximum dose of tuberculin which is tolerated without provoking reaction. The dose-limit varies much in different cases. Sometimes it is reached after some tenths of a cc. of TBk_5, or even of TBk_6. In other cases, it is only reached after the use of the stronger solutions. Where tolerance is slight, patients may none the less be successfully treated by means of weak solutions only, as TBk_5, TBk_6. Where tolerance is good, the entire scale of solutions may be employed, care being taken that the increase of dose at successive injections is small.

Whenever, during a course of treatment, the optimal dose has been reached, i.e., the smallest dose which appears to be active without inducing reactionary disturbance, that dose should be maintained so long as the patient continues to make progress. The optimal dose is distinct from the dose-limit of tolerance, which it may approach, however. From time to time during treatment, successive optimal doses may be determined.

2. *In Pyrexic Cases*, debilitated subjects, and children, it is desirable to commence treatment with still smaller doses, using the weakest of the solutions, i.e., TBk_6, which may, if necessary, be further diluted. The same precautions in respect of increase of dosage will be carefully maintained.

If, in the course of treatment, any intercurrent affection appear, it is well to suspend injections or increase the interval between them, at

the same time diminishing the dose. The same remark applies to women patients during the monthly period.

The procedure is necessarily lengthy. Its therapeutic effects may appear decidedly only after several months, but the tendency to undue reaction is thereby avoided, and the possibility of troublesome relapse largely excluded.

3. *Intestinal Tuberculosis* may be treated solely by hypodermic injections of Béraneck's tuberculin according to the method for internal tuberculosis. This may be combined with enemata containing tuberculin. Thus, to 100 cc. sterilized physiological solution, add 1 cc. TBk_1. The enema suitably consists of 300 cc. physiological solution, with the addition of 3 cc. TBk_2. It is given at a temperature of 38 to 40° C., by means of an œsophageal tube of medium size, which is passed high up into the great intestine. The enema should be retained as long as possible. It may be repeated according to the principles laid down for hypodermic injection.

4. When *Surgical Tuberculosis* (tuberculosis of bones, cold abscess, etc.) is complicated by pulmonary or kidney lesions, it should be treated by hypodermic injections of Béraneck's tuberculin, in the way indicated above.

When the condition is one of surgical tuberculosis *alone*, intrafocal injections are serviceable. Where possible, the site of the tuberculous lesion should be determined by X rays. The further procedure is as follows. The tuberculin is injected directly into the diseased focus, stronger solutions being permissible, e.g., TBk_3, TBk_2, TBk_1. Following intrafocal injection, there may occur general reaction of varying degree, and a local reaction within the affected area. It is this local reaction which is desired, care being taken to regulate its intensity.

In the absence of internal tuberculosis, one may commence with intrafocal injection of $\frac{1}{10}$ cc. TBk_2. If local reaction occur, treatment is continued with the same dose. If reaction is slight or *nil*, the dose is increased by $\frac{1}{10}$ cc., until the desired reaction appears. If, after injection of 1 cc. TBk_2, no local reaction occur, solution TBk_1 may be employed, according to the same graduated method of increase, maintaining that dose which determines local reaction. In course of treatment an abscess may develop, which, on evacuation, commonly heals quickly, leading to satisfactory cicatrization. Intrafocal injections may be made, according to the case, once or twice a week. It is always well to wait until general reaction has subsided before making further injection.

5. *In Lupus* it is preferable to commence by general treatment, that is, by hypodermic injections of tuberculin as for internal tuberculosis. After two or three months of hypodermic injections, these may be combined with intrafocal injections. For this purpose, TBk_2 may be used, in small doses. If TBk_2 produces no effect, TBk_1, or even TBk (pure) may be employed, that strength of solution being maintained which seems to determine cicatrization of the lupus areas.

TUBERCULOSIS (Calmette Reaction in).

E. Graham Little, M.D., F.R.C.P.

Graef[1] made careful examination of this test in fifty cases of very varied suspected tuberculous disease. His conclusions are: (1) The test is fairly reliable and is worthy of wide and repeated trial; (2) In some advanced cases no reaction occurs, for reasons which as yet are unexplained; (3) The tuberculin used may be responsible for some failures. But the author regards the reaction when obtained as "good evidence of the presence of tuberculosis."

Sequeira[2] reports a series of cases tested with tuberculin procured directly from Calmette. A freshly prepared 0·5 per cent solution was used, of which one drop was introduced into the conjunctiva in each test. Positive reaction followed in all of sixteen cases of lupus vulgaris, in one case of verruca necrogenica, in all of four cases of erythema induratum, in one case of "folliclis" (follicular tuberculide), in all of four cases of suspected tuberculous ulceration. Negative results were obtained in three cases of extensive syphilitic ulceration. Mixed results are recorded in lupus erythematosus, some showing negative, some positive reaction. Of four cases of psoriasis, one gave a positive result with no apparent symptom of tuberculous disease. No bad effects followed in any test, an immunity which Sequeira ascribes to the use of *fresh* solutions, and careful avoidance of the test in persons whose eyes showed signs of any inflammation.

References.—[1]*Med. Rec.* May 9, 1908; [2]*Brit. Med. Jour.* Oct. 17, 1908.

TUBERCULOSIS (Ophthalmo-Reaction). (*See also* Eye, Tuberculosis of.)

Ernest E. Maddox, M.D., F.R.C.S.

Several hundreds of communications have been made during the past year with reference to Calmette's ophthalmo-reaction. The general consensus of experience is that its reliability is well established, though it is not suitable for children under two years of age, or for advanced cases of tuberculosis. It appears to be extremely important to ensure that the eye into which the instillation is made should be both normal at the time, and with no doubtful past history, since a considerable number of cases have now been placed on record, in which more or less serious complications have arisen in the eye which is subjected to the instillation. These include pustular conjunctivitis, folliculosis, growths on the tarsal conjunctiva, episcleritis, keratitis, corneal ulceration, and iritis. A few very serious and persistent ophthalmic disturbances have been set up. This being so, many ophthalmic surgeons are now inclined to avoid the use of this test if other measures suffice, considering the eye rather too valuable an organ with which to run even the smallest unnecessary risk. Happily what Vallee has called the cuti-reaction, introduced by C. v. Pirquet, is just as available in its various modifications. Should these prove indefinite, there remains still the general reaction, obtainable from the injection of tuberculin subcutaneously, to fall back upon.

Percival Hay has summarized results published by a number of

observers, and finds that by Pirquet's method there was positive reaction in 81·5 per cent of tuberculous cases, as compared with 83·8 per cent with Calmette's method. This difference is so small as to be within the limits of statistical error. In suspected cases Pirquet gave 70 per cent as against 52 per cent with Calmette, while in non-tuberculous cases Pirquet gave 60 per cent as against 15 per cent. This last statement, it must be confessed, greatly damages the value of Pirquet's method, and is probably explainable in part by want of accurate interpretation of the physical signs produced in the skin. There are four ways of obtaining a cuti-reaction, viz., by vaccination, by rubbing, by inunction, and by the inoculation of blisters.

Vaccination was C. von Pirquet's first recommendation. He made a 25 per cent solution of Koch's alt tuberculin in a menstruum composed of one part of carbolized glycerin (5 per cent phenol) to two parts of physiological salt solution. One or two drops of this were dropped on the outer side of the arm, while a neighbouring patch of skin was equally moistened with physiological salt solution to act as a control. With an instrument rendered sterile in a spirit flame he then scarified the skin through both drops, but without drawing blood. No dressing was applied, and the vaccine was allowed to dry before replacing the clothes. In positive cases a red papule appears within a few hours, but sometimes after only twenty-four or, more rarely, forty-eight or seventy-two hours. The papule averages 10 mm. in breadth, and may be combined with vesicles or pustules. The papule remains at least five days, upon an infiltrated base, surrounded by a sharply defined zone of hyperæmia, which in the early stage, however, is more diffuse. Instead of Pirquet's 25 per cent solution, Junker recommends one of 10 per cent as amply sufficient, in aqueous solution containing 3 per cent glycerin and 0·5 per cent phenol. The great difficulty is to know exactly what constitutes a positive reaction, and herein Pirquet's test is inferior to Calmette's. It has been suggested that the reaction obtainable in people apparently free from tubercle may be an evidence of latent tuberculosis, but this is at present scarcely more than a conjecture.

Skin Friction, introduced by Lignieres (October 19th, 1907), is the simplest and neatest method for ophthalmic work, and is free from the objection which might be raised by prejudice against vaccination. After cleaning and preferably shaving an area of skin, of two or three square inches, he gently rubs in some of Koch's dry alt tuberculin. This produces a crop of papules if the reaction be positive, appearing generally from the twenty-fourth hour.

Moro's modification of Pirquet's method consists in rubbing into the skin an ointment composed of equal parts of "old tuberculin" and lanolin, leaving it uncovered for ten minutes, while Woodcock's method is to raise two small blisters on the back with a water dressing for two days after they have risen, to lessen the hyperæmia. Then pure new tuberculin (T.R.) is applied to one surface and allowed to dry. This surface becomes rosy red in twenty-four hours, with a blush around

in positive cases, the untreated surface being comparatively pale. Hypodermic injection of Koch's tuberculin to test for a *general reaction* should be avoided after Calmette's test unless the latter has quite failed, for some have found it to light up a fresh reaction in an eye previously tested and keep it inflamed over a long period of time.[1] Moreover, it is sometimes followed by severe local reaction, whereas a mild type of lymphangitis appears to be the only complication that has hitherto attended the skin reaction. It is alleged that tuberculin introduced hypodermically renders bacilli in a state of repose mobile, thus spreading them about the whole system, and generalizing the local ailment.[2] This accident, however, is so rare, and so probably due to overdosing, that few allow it to deter them from making the test when it is indicated, since it so far appears to be quite safe if the injection be carefully dosed, and used in minimal quantities.

Schoeler,[3] of Berlin, records two cases of primary tuberculosis of the optic disc in each of which the injection of Koch's tuberculin (T.V.) in very small quantities produced a marked rise of temperature, thus confirming the diagnosis. Many others report satisfactory results during the year from this valuable procedure, revived by von Hippel for ophthalmic affections in 1904, after Koch's original recommendations had practically fallen into disuse. As a preliminary, the patient's temperature should be taken every two hours for a few days to ensure that it never rises above the normal. The patient should also be subjected to careful physical examination, since the presence of active tuberculosis elsewhere contraindicates this method of diagnosis. The so-called alt-tuberculin (T.V.) is to be diluted with 0·5 per cent phenol solution, and 1 mgram injected subcutaneously into the interscapular region. Axenfeldt prefers the hour of 11 a.m. The temperature should still be taken every two hours, and is generally found to rise early in the morning of the next day. If the rise be at least by one degree, accompanied by malaise and headache, the result is considered positive. If the result be doubtful, another injection of 1 mgram may be given in forty-eight hours, and a third of 3 or 5 mgrams forty-eight hours later still. The positive result may be confirmed by a local reaction at the seat of disease, and this is more frequently the case when the doses are large (5 to 10 mgrams), and consists in an aggravation of the inflammatory symptoms. Thus œdema of the eyelids may be noticeable in cases of tuberculosis of the conjunctiva, the secretion being increased and the conjunctiva swollen, the yellowish nodules increasing in number and size and becoming more yellow. In tuberculous scleritis, besides increase of ciliary injection and pain, the yellow nodule, if present, increases in size and is often surrounded by new and smaller nodules. A similar increase in the number of nodules may occur in tuberculous iritis, the vitreous opacities becoming denser and the vision less acute (Török.) Should a small abscess form at the site of injection, the pus is generally found sterile. Some patients exhibit no reaction at the site of injection. In

others a sharply defined swelling, red and hard, may appear after several hours, disappearing in a day or two and leaving a small indolent thickening beneath the scar.

Treatment of ophthalmic affections by tuberculin injections after von Hippel's method, has been greatly taken up during the past year. While the "old tuberculin" is at present preferred for diagnostic purposes, it is the new tuberculin (T.R.) which is employed therapeutically. Since the dilutions do not keep longer than a fortnight, they should be freshly prepared, and clear. Most commence with $\frac{1}{500}$ mgram dissolved in a sterilized solution of glycerin, and some gradually increase it up to 1 mgram, the maximum dose recommended by von Hippel. The temperature should not be allowed to rise above 100° F. It is well to take the temperature every two hours, allowing the patient, however, to be out of doors until fever begins, when he should remain in bed till it is over. It generally does not last longer than six to eight hours. Török records, as a frequent experience, the patient reacting with high fever at one time, after having experienced none on other occasions, despite the fact that the injections were made from the same solution, under the same circumstances, and at the same hour. Should the "old tuberculin" used for diagnostic purposes be found to exhibit the same peculiarity, its value as a test would be considerably discounted, and this point requires investigation.

New injections should only be made after the temperature has returned to the normal. Von Hippel carries on the treatment for several months after the apparent arrest of the pathological process, and the disease is regarded as cured when the patient ceases to react to larger doses than 1 mgram. Should he in a few months be found to react to very much smaller doses than those at which he left off, another course is indicated. "Ultimately he will not react to 150, 250, 500, or even 1000 mgram., even some time after the treatment has been stopped. He may then be considered to be definitely cured. This is the treatment which is meeting with great success at Stuttgart Sanatorium."[4]

Snell,[5] Hancock, and Mayou[6] have used tuberculin treatment under guidance by the opsonic index with favourable results.

A case diagnosed as solitary or conglomerate tubercle of the choroid, by Mr. Ernest Clarke, and treated by Sir Almroth Wright, is illustrated in *Plate LIV, Fig. A* showing the appearance before treatment by tuberculin, with $V = \frac{6}{36}$, while *Fig. B* illustrates the atrophic patch left about eighteen months after, with $V = \frac{6}{9}$.

Spengler,[7] of Davos, injects patients whose bacilli are mostly of the human kind, with bovine tuberculin, and *vice versa*, and it may be, as Allen suggests, that one of these forms of tuberculin may succeed better than another if exchanged empirically when a variation appears required, without even investigating the nature of the bacilli.

I have drawn up the following table to present at a glance the salient features of the different methods of employing tuberculin.

TUBERCLE OF THE CHOROID TREATED BY TUBERCULIN

(Mr. Ernest Clarke and Sir Almroth Wright's case.)

Fig. A.—Before treatment.

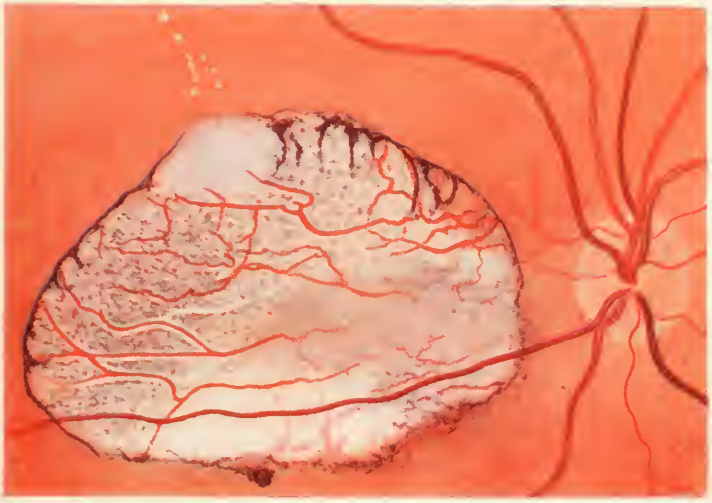

Fig. B.—About eighteen months after treatment.

Local Reactions with Tuberculin.

		Effect commences	*Lasts*
Calmette (Ophthalmo-reaction)	1 per cent, or preferably 0·5 per cent of Alt (T.V.) in aqueous solution	6 to 36 hours	12 hours to a week or more
V. Pirquet (Vaccination)	25 per cent Alt (T.V.) in one of carbol-glycerin (5 per cent phenol in glycerin) to 2 of normal saline solution	A few hours (sometimes 24 or even 72 hours)	5 to 8 days
Lignieres (Skin friction)	Alt (T.V.) dry	24 hours	A few days
Moro (Inunction) ..	Alt (T.V.) and lanolin, equal parts	24 hours	Ditto
Woodcock (Blistering)	Neu (T.R.) dry and pure ..	24 hours	Ditto

General Reaction with Tuberculin.

For diagnosis ..	Alt (T.V.) 1 mgram in 0·5 per cent phenol solution	From a few to 24 or 48 hours	A few hours
For treatment ..	Neu tuberculin (T.R.) $\frac{1}{500}$ mgram up to 1 mgram or more. (Some go up to 5 or 10 mgram)	12 to 24 hours (sometimes none)	6 to 8 hours

References.—[1]Derby, *Arch. of Ophthalmology*, 1908, p. 522; [2]Török, *Ibid.* p. 532; [3]*Ophth. Rev.* 1908, p. 220; [4]Kraemer, reported by Percival Hay, *Ophthalmoscope*, 1908, p. 505; [5]*Trans. Ophth. Soc.* 1907; [6]*Ophthalmoscope*, July, 1907; [7]*Presse Méd.* Dec. 7, 1907.

TUBERCULOSIS OF KIDNEY. (*See* Kidney, Tuberculosis of.)

TUBERCULOSIS OF LARYNX. (*See* Larynx, Diseases of.)

TUBERCULOUS DISEASE OF HIP. (*See* Hip Joint.)

TYPHOID FEVER. (*See also* Paratyphoid Fever.)

E. W. Goodall, M.D.

Etiology.—It has been known for some years past that the bacilli of typhoid fever could be recovered from the urine and stools of persons who had suffered from the disease, for a very considerable time after the attack; and though it has been suggested that such persons might be the source of fresh cases of the disease, no proof of such an occurrence appears to have been offered until about two years ago, when the subject was investigated somewhat minutely by German hygienists in connection with the prevalence of typhoid fever in South Germany. In this enquiry instances were brought to light in which limited outbreaks or a series of sporadic cases of typhoid fever occurred, the only source of which was a person who had some time before suffered from an attack of the disease, and whose stools were found still to contain typhoid bacilli. A most striking example was that of the proprietress of a bakehouse in Strassburg. It was noticed that nearly every new employee developed typhoid fever sooner or later after entering her service. The woman had suffered from the disease herself some ten years previously. On examination, it was found that her fæces contained typhoid bacilli and that her blood gave a positive serum reaction in dilution up to 1–100. It is also particularly to be observed that she was in the habit of preparing the meals for her workmen.

Since attention has been drawn to the subject, several instances of a similar nature have been described. One of the earliest occurring in this country, and certainly the one that has hitherto been worked out in most detail, has been narrated by D. S. Davies and I. Walker Hall.[1] Briefly put, the facts are as follows: The Brentry Reformatory, near Bristol, is an institute for 240 female inmates and 24 resident staff. It was opened in 1899. Typhoid fever first appeared in September, 1906, and from that time to January, 1907, a few cases occurred. Then there was a break in the cases till May, 1907, when some more of the inmates failed with the disease, and cases continued to occur in small groups at varying intervals till November. Up to November 24th, 1907, there were altogether 28 cases. Quite early in the history of the outbreak there was evidence to show that the disease was milk-borne; and in November, 1906, the milk was sterilized before use. The water-supply was good, and the drainage did not present any such defects as might lead to the occurrence or distribution of the disease. The neighbourhood of the institution was free from typhoid fever. The source of the outbreak remained a mystery, the more puzzling because the cases were evidently immediately caused by contaminated milk in spite of its sterilization. Dr. Davies was then consulted, and his knowledge of the work that had been carried out in Germany led him to make enquiry concerning the previous medical histories of certain of the inmates. He found that a Mrs. H., a woman aged 50, who was employed in the institution as cook and dairymaid, had suffered in January, 1901, from a severe attack of typhoid fever. She had been admitted to Brentry in April, 1906, had been employed in the kitchen up to October 13th, 1906, and from that time till November, 1907, in the dairy also. In his account of the outbreak, Dr. Davies states that "the milk, after sterilization, is stored in the dairy, whence it is measured out for the various 'villages' by means of a hand-dipper. All the milk passed through her (Mrs. H.'s) hands. In the passage leading from the kitchen to dairy is a w.c. accessible to the kitchen workers, containing a lavatory basin which was not in use. On November 13th, I requested that Mrs. H. should be absolutely excluded from all kitchen and dairy work and isolated as 'suspect' until I could arrange for a pathological examination of her blood, urine, and stools. This was done. At the same time I ventured the opinion that, allowing for the incubation of typhoid fever, no further case should occur. The last case occurred on November 25, twelve days after her isolation commenced; and the institution has remained free up to the present time (March, 1908)." Now Mrs. H.'s stools were bacteriologically examined on Nov. 18th and Nov. 29th, 1907, and no typhoid bacilli could be detected. On Dec. 20th she had an attack of slight abdominal pain, and passed a light yellowish-brown stool of soft consistence. This was examined, and typhoid bacilli, giving all the typical reactions, were recovered from it. The excreta of the other inmates employed in the kitchen and dairy were examined during November, 1907, with negative results.

Mrs. H.'s previous history was extremely interesting. As already stated, she suffered from a severe attack of typhoid fever in January, 1901.* On Feb. 3rd, 1904, she was sent from Bristol to assist in the kitchen at Grove House, Brislington. This is an institution for thirty-six girls, aged 5 to 15, boarded out by the Bristol Guardians, and supervised by four officers. It was opened in 1899. Typhoid fever first appeared in the third week of May, 1904, three months after Mrs. H. had entered the service of the institution, and cases continued to occur to the number of twenty-five, at intervals of a week or more, till the institution was closed at the end of the following September. Besides the twenty-five certain, eight suspicious cases were also observed. There was no typhoid fever in the district, and the source of the outbreak was not ascertained. Amongst Mrs. H.'s duties while she was employed at Grove House were the reception of the milk from the tradesman who supplied it and the preparation of it for consumption by the children. All the milk was kept in the kitchen. On March 4th, 1905, Mrs. H. was engaged as cook at a children's home in Clifton, where there were thirty girls. On May 8th one of the girls developed typhoid fever, for which no reasonable cause could be found. Mrs. H. left at the end of April. There were no more cases of typhoid fever.

In this case we have an instance in which the typhoid bacilli were at times present in the fæces of a person who had suffered from the disease seven years previously. George Dean[2] has recorded an instance in which, so long as twenty-nine years after an attack of typhoid fever, typhoid bacilli could still be found in the stools. This person, a medical man, had not, so far as he knew, been the means of giving the disease to others. But Gregg[3] reports a case in which the interval was forty-nine years. Seven cases of typhoid fever occurred in a small boarding-house in a farming town between August, 1905, and March, 1908. The mistress, who prepared all the food herself, had had the disease in 1856. No other cases occurred in the neighbourhood at the time the respective patients were taken ill. An examination of the woman's fæces gave pure cultures of a bacillus in every way similar to the typhoid bacillus.

In view of these observations, attempts have been made to estimate the number of convalescents from typhoid fever whose excreta still contain the specific organism. The results of examinations made by different bacteriologists vary somewhat; but so far it has been found that during early convalescence about 10 to 13 per cent of the cases are still excreting the bacillus. After six weeks, however, the number falls to between 1·5 and 4 per cent. Probably the higher of these two figures is nearer the truth. In fact, more recently Park has found the number to be 5 to 6 per cent. Kayser found that of 101 cases in which the excreta were examined, upwards of two years after the attack of fever, three were still harbouring the bacilli.

* She was treated at the Bristol Royal Infirmary.

The investigations of the German bacteriologists brought another fact to light, viz., that it was not only persons previously affected by typhoid fever whose excreta contained the bacillus. Klinger examined the fæces of 1,700 healthy persons who, so far as they knew, had never previously suffered from typhoid fever, and discovered typhoid bacilli in eleven of them. This was in a locality where the disease was prevalent. Cases of this nature are also capable of setting up the disease in other persons. The most interesting case of the kind is that recorded by Soper and Park.[1] In March, 1907, a woman who was a cook was suspected of having been the cause of several cases of typhoid fever. During the previous eight years she had been employed in eight families, and in seven of them typhoid fever had broken out within a few weeks or months of her entering upon her duties. Bacteriological examination revealed the fact that fully 30 per cent of all the bacteria in her fæces were typhoid bacilli. Careful cultural and agglutination tests showed that these bacilli differed in no respect from those obtained from acute cases. The urine was free from bacilli. In June, 1908, Park made the following statement concerning the case: "This woman has now been isolated for sixteen months. Weekly examinations of the stools have usually revealed large numbers of bacilli, but there have been several intervals when for one or two weeks no bacilli could be detected. Treatment by intestinal antiseptics has proved unavailing. Hexamethylenamin (urotropin) in doses gradually increasing from 100 up to 150 gr. a day, has been given for a number of weeks with no apparent benefit. Attention to diet and mild laxatives have caused the greatest reduction, but not their disappearance. This suggests that the chief development of the bacilli is in the intestines, although the source of the infection is probably the gall-bladder."

The persons who harbour typhoid bacilli in their excreta are called "carriers," and the German authorities speak of "acute carriers"—those individuals who have never suffered from typhoid fever, but who for a short time have the organism in the excreta—and "chronic carriers"—those persons who have had typhoid fever and whose excreta still contain the bacilli for months or even years after the attack. In most of the "chronic carriers" that have so far been discovered the excreta have not continuously contained the bacilli. There are periods when the stools are free from these organisms; there is an intermittent passage of them. In some instances a slight attack of illness accompanies or immediately precedes the passage of stools containing bacilli. It has been surmised that this illness may in some cases at any rate be a slight inflammation of the gall-bladder. In Dean's case, already referred to, the chronic carrier, a medical man, had suffered from many attacks of biliary colic and jaundice. Now it has long been known that the bacilli are to be found in the gall-bladder in nearly all cases of fatal typhoid fever, and that they persist in that organ for a very long time after the attack. Cases are also on record in which gall-stones containing typhoid bacilli have been

removed from the gall-bladder ; the patients in these cases sometimes have, sometimes have not, previously suffered from typhoid fever. Gall-stones are found more frequently in women than in men, and typhoid "carriers" are more often females than males. These facts have led writers to suggest that in "carrier" cases, especially in the chronic cases, the bacilli not only persist in the gall-bladder, but set up occasional attacks of inflammation, perhaps on some occasions very slight, and that as a result of these attacks, active bacilli are discharged into the intestine. This hypothesis would but partly explain the intermittency of the presence of the bacilli in the fæces, for it is not every "carrier" who suffers from these slight attacks, which may be referred to the gall-bladder. It is a curious fact that gross lesions of that organ are certainly rare ; and, so far as the first few weeks of convalescence are concerned, cholecystitis is by no means common.[5] The subject is one of much interest and importance, but also of difficulty. The exact degree of influence of the "typhoid carrier" in the prevalence and dissemination of typhoid fever has yet to be ascertained.

Since this account was written, a very interesting memoir by Lieut.-Col. Semple and Capt. Greig[6] has appeared. These authors deal with the subject of typhoid carriers, especially amongst English soldiers serving in India. They found examples of both acute and chronic carriers. They draw attention to the danger of persons who are nursing enteric fever cases becoming carriers, even though they have not themselves suffered from the disease. They examined the excreta of four hospital orderlies who had been employed with enteric cases for six months ; two of them were excreting typhoid bacilli in the fæces. In ten out of eighty-six patients convalescent from enteric fever the bacilli were present in the excreta. The authors confirm the intermittency that has been noticed in the presence of these organisms in the stools of carriers. They record experiments which go to show that the typhoid bacillus does not remain alive for long after it has been discharged from the body. Exposure to the sun kills them very rapidly. They make the statement that urotropin cannot be relied upon to kill the bacilli in the stools and urine.

Additional evidence that *flies* may act as the carriers of the typhoid bacilli has been adduced by E. Klein.[7] Heywood Wilshaw had investigated an outbreak of typhoid fever in which, after the occurrence of one case in a house forming one of a row, a number of fresh cases made their appearance in the neighbouring houses. "All known channels of transmission, for example, personal contact, defective drainage, polluted water or milk, could be excluded. The only condition common to all the houses of the row was this—that they were swarming with flies" (Klein). Twelve flies caught in these houses were minced in a sterile dish with $\frac{1}{2}$ cc. of sterile salt solution, and the resulting turbid fluid used for cultures. Amongst other media two large plates containing Drigalski-Conradi medium were used. On these plates, besides numerous colonies of *B. coli communis*,

two or three colonies grew which presented appearances that might indicate the *Bacillus typhosus*. These were further examined, and found to consist of organisms which were not distinguishable from *B. typhosus*, except in a certain insignificant difference probably due to difference of strain.

Clinical Features.—In four cases reported by Huchard and Amblard[8] a sudden slowing of the pulse-rate, increased arterial tension, and galloping cardiac rhythm were the immediate precursors of intestinal hæmorrhage and perforation. On the occurrence of these complications the tension fell and the pulse-rate fell rapidly.

A case of great interest has been placed on record by Laverson.[9] The patient was a woman, aged 26. She had suffered from typhoid fever several years prior to the illness now described; and for a number of weeks immediately before the illness she had been nursing a brother through a severe attack of typhoid fever. The attack commenced with intense frontal headache, vomiting, photophobia, and fever. On the seventh day Kernig's sign was present, and on the eighth there was a positive Widal's reaction. Then rigidity of the neck supervened, and before death, which occurred on the sixteenth day, there were hæmaturia and œdema of the lungs. The fluid obtained by lumbar puncture showed the presence of typhoid bacilli. Post mortem, pus was found in the pia-arachnoid on the front of the right cerebral hemisphere, and to a smaller extent in the frontal portion of the left. No tubercles could be found. There was no basal meningitis; the ventricles were moderately distended with slightly turbid fluid. Smear preparations showed a large number of typhoid, but no tubercle bacilli. There were no other lesions, not even any ulceration of the intestines; the spleen was not enlarged.

Rieser,[10] of New York, in an exhaustive article, discusses the etiology of *ulceration of the larynx* in typhoid fever. He has collected all the reported cases, to which he has added two that came under his own care, making 281 in all. Amongst the causative factors are: (1) Friction and irritation caused by the acts of phonation and deglutition; (2) Inflammation of the mucous membrane; (3) Thermic influences, such as heat and cold, especially when alternating rapidly; (4) Bacteria—the *Bacillus typhosus* and streptococci; (5) In one case direct extension of inflammation from double parotitis and pharyngitis; (6) Dorsal decubitus, leading to venous stasis and softening of the tissues of the post-pharyngeal wall. The frequency of the lesion is about 12 per cent, according to Luning from an analysis of 1032 autopsies. It was 10·7 per cent in the 2000 Munich autopsies. Luning states that the posterior laryngeal wall at the insertion of the vocal cords is the most frequent site of the ulceration. In over 70 per cent of the reported cases the ulceration occurred after the third week of the attack of typhoid fever. But it may occur at any time from the first to the tenth week. Clinically the onset is usually insidious. Dyspnœa and suffocative spasm may supervene before the condition is suspected in severe cases of the fever. But in less severe cases,

hoarseness, alteration of voice, aphonia, inspiratory stridor, dyspnœa, metallic cough, and dysphagia are the symptoms in the order in which they usually occur. But at any time acute spasm may arise, necessitating instant tracheotomy.

The prognosis of cases of typhoid fever with ulceration of the larynx is bad, the mortality of the collected cases being 65 per cent.

The TREATMENT consists in first making preparations for instant tracheotomy. Then local spraying with a 2 per cent solution of **Cocaine** or a 1–1000 of **Adrenalin Chloride** will often give relief. The **Inhalation of Steam** is also valuable. Ice should be applied externally over the larynx. Intubation should not be practised: the frequent presence of abscess formation being a contraindication. If surgical relief is required, it should be given by means of tracheotomy.

A case of inflammation with slight *suppuration of the thyroid body* during convalescence from typhoid fever is recorded by Henri Roger.[11] The patient was a woman, aged 29. A bacteriological examination of the pus revealed the presence of the *Bacillus typhosus*. Roger was able to find only nineteen recorded cases of a similar nature. Another case of thyroid suppuration was under the care of Melandri and T. P. Legg,[12] in the Italian Hospital. The patient was a man, aged 26. The illness for which he was admitted to hospital appeared from the clinical signs to be acute pneumonia. A fortnight later there was sore throat, with a rash, which was taken to be scarlet fever. Three weeks later the thyroid began to swell. An abscess formed, and typhoid bacilli were found in the pus. It was then ascertained that the patient's serum gave a positive Widal's reaction. Possibly the whole illness was enteric fever of an anomalous type.

In an interesting paper on *Perforation of the Gall-bladder* during typhoid fever, Ashhurst[13] gives an account of two cases which were operated upon, and references to nineteen others recorded in the literature on the subject (*see also* GALL-BLADDER, SURGERY OF).

Ashhurst states that amongst 2864 cases of enteric fever treated in the Episcopal Hospital, Philadelphia, from January 1st, 1905, to October 1st, 1907, there were eighteen cases of cholecystitis with four deaths; these include the two cases which are the subject of his paper, and these two were the only ones that were operated upon.

DIAGNOSIS.—A case in which there were marked signs of cerebro-spinal meningitis, but in which the blood serum gave a positive reaction with the bacillus typhosus and that bacillus was found in the fluid obtained by lumbar puncture, is reported by E. H. M. Milligan.[14] The opsonic index with the meningococcus was normal.

We have in previous volumes alluded to the palmo-plantar or Philipowicz's sign in typhoid fever. The sign is a yellow discoloration of the palms and soles, affecting the most prominent parts, the colour varying from that due to a tobacco stain up to a bright yellow colour. Giovanni[15] states that in 220 cases of typhoid fever treated by him during six consecutive years, this sign was present in 216. Usually it appeared during the first week, and was at its full development

at the end of the second week. It reappeared in relapses. In severe cases the discoloration spread to the fingers. Giovanni has seen this sign in some cases of acute pneumonia and acute rheumatism, but never in scarlet fever, diphtheria, measles, tuberculous meningitis, acute miliary tuberculosis, or septicæmia. [Though I have been on the look-out for this sign for some years past, I have seen it only in two or three cases, so that it is not common in typhoid fever as seen in this country.—E. W. G.]

In last year's *Medical Annual* (p. 596) it was stated that Chantemesse had devised an ophthalmic test for typhoid fever like that of Wolff-Eisner and Calmette for tuberculosis. Braga[16] applied the test to several cases of typhoid, and found that the reaction was always present, but varied in its intensity and duration according to the mode of preparation of the toxin employed. In a series of cases in which the toxin had been heated to 70° C. for three hours there was no reaction with non-typhoid cases, whereas with unheated toxin non-typhoid cases reacted only slightly, and never to such a marked degree as the typhoid cases. On the other hand, Kraus, Lusenberger, and Russ[17] state that as a result of an enquiry into the value of this reaction in an epidemic of typhoid fever in Adelsberg, they have come to the conclusion that it is of little if any service in diagnosis. It is true that a solution of typhoid toxin will produce the reaction in a patient suffering from typhoid fever to a greater degree than in a normal person; but solutions of the toxins of paratyphoid, coli, and the tubercle bacillus will give rise to the same reaction in typhoid patients. The reaction is therefore not specific.

Treatment.—A. Seibert[18] reports sixty-one cases in which he used a **Milk-free Fluid Diet.** After an initial dose of calomel, the patient is kept on water only for twenty-four hours. At the end of that time he is put on strained rice, oatmeal or barley soup, with extract of meat and yolk of egg. Later other broths are allowed, and before feeding some hydrochloric acid is given. Strong and Kemp advocate the same treatment. Seibert had only one death in his sixty-one cases, and the duration of his cases was shorter than usual. An advantage claimed for the diet is the elimination of fermentation of undigested milk. Rectal irrigations are employed by these observers.

References.—[1]*Proc. Roy. Soc. Med.* (Epid. Sect.) Ap. 1908; [2]*Brit. Med. Jour.* Mar. 7, 1908; [3]Quoted in *Amer. Jour. Med. Sci.* Aug. 1, 1908; [4]*Jour. Amer. Med. Assoc.* Sept. 19, 1908; [5]See Paper by J. C. G. Ledingham, *Brit. Med. Jour.* Oct. 17, 1908, for bibliography, and a letter signed C. R., *Ibid.* Mar. 14, 1908; [6]*Scient. Mem. Med. & Sanit. Dept. Gov. India*, N.S. No. 32, Calcutta, Sup. Gov. Printing, 1908; [7]*Brit. Med. Jour.* Oct. 17, 1908; [8]*Rev. de Méd.* July 10, 1907; [9]*Univ. Pennsyl. Med. Bull.* Ap. 1908; [10]*Amer. Jour. Med. Sci.* Feb. 1908; [11]*Arch. Gén. de Méd.* Oct. 1907; [12]*Lancet*, Jan. 25, 1908; [13]*Amer. Jour. Med. Sci.* Ap. 1908; [14]*Brit. Med. Jour.* May 30, 1908; [15]*Rif. Med.* Jan. 20, 1908; [16]*Ibid.* May 2, 1908; [17]*Wien. klin. Woch.* Nov. 7, 1907; [18]*Med. Rec.* June 20, 1908, in *Brit. Med. Jour.* Epit. July 25, 1908.

ULCER. (*See* Gastric Ulcer.)

ULCER, CHRONIC. *E. Graham Little, M.D., F.R.C.P.*

Unna's method of treating chronic ulcer of the leg with **Adhesive Zinc Dressings** has perhaps undeservedly fallen into disuse, and its revival is strongly urged by Huber.[1] This dressing is made as follows: 40 grams glycerin, 40 grams water, 10 grams gelatin in shreds, and 10 grams oxide of zinc, are mixed by heating gradually in a water bath with constant stirring, and is liquefied as it is required. Before using, the ulcer is cleansed by soaking with lysol or chinosol bandages, and the whole leg is shaved and cleansed with soap and water and ether. The liquefied mixture is painted with a brush over the whole leg, the ulcer being filled up with an antiseptic powder, e.g., airol, and covered over with grease-free cotton wool, so as to overlap the diseased area. Two bandages are then prepared of starched gauze, each 10 cm. wide and 10 metres long, and rolled in two halves from each end to the middle; the bandages are wetted with water, well squeezed out, and applied from the toes to the knee, the second bandage being put over the first. The leg is to be kept in a horizontal position near a stove or in the sun until the bandage is quite hard, and the dressing kept *in situ* for from three to four weeks, when it is slit up with shears to remove it. It is advisable for the patient to wear continuously a knitted bandage after the ulcer is cured.

REFERENCE.—[1]*Strasburg. med. Ztg.* in *Lancet*, Mar. 28, 1908.

ULCER, PERFORATING, OF THE FOOT.

(*Vol.* 1898, p. 549)—Chipault recommends **Nerve-stretching.** The nerves to be stretched are the internal plantar beneath the internal malleolus, the musculocutaneous above the external malleolus, and the external saphenous at the edge of the tendo-Achillis. At the same time all ulcerated and necrotic tissue must be so removed as to render the ulcer oval and capable of obliteration by suture.

URETER, CALCULUS IN. (*See* CALCULUS.)

URETER, STONE IN. (*See* CALCULUS.)

URINE. (*See also* ALBUMINURIA.)

Prof. J. Rose Bradford, D.Sc., M.D.

Oxaluria.—The origin of oxalates in the urine is of great importance from the point of view of the treatment of oxaluria and the prevention of the formation of oxalate of lime calculi. The great bulk of the oxalates in urine is undoubtedly derived directly from the food, and as pointed out by Langdon Brown,[1] rhubarb, spinach, strawberries, and tomatoes are the articles which are most prone to produce oxaluria, but many other articles of diet, such as potatoes, French beans, plums, tea, coffee, and cocoa, may also lead to the excretion of oxalates in smaller amounts. In a large number of cases of oxaluria, however, this condition persists when a diet free from oxalates is given, and hence the condition cannot be ascribed to the mere absorption of oxalates in the food. The other chief sources of oxaluria are the products of decomposition resulting from fermentation of the gastric contents. This fermentation is usually associated with a deficiency in the secretion of hydrochloric acid in the stomach,

and the oxalic acid is derived from the fermentation of carbohydrates, especially sugar. All observers are agreed that oxaluria may arise in one or other of these two ways, but there is some difference of opinion as to whether oxaluria ever arises as a sequel to the endogenous formation of oxalic acid. Oxalic acid is closely allied to uric acid, and in the laboratory can be formed from uric acid, and thus it has been supposed that the same process may occur in the body. Further, oxalic acid can be derived from uric acid by the action of freshly excised liver tissue; but a large number of observers have failed to detect oxalates in the urine when a diet free from oxalates, e.g., milk, has been given. Thus it is probable that most cases of oxaluria arise either as the result of excessive ingestion of oxalates or as a sequel to gastric fermentation.

In the treatment of oxaluria a **Diet** consisting of meat, milk, eggs, butter, and rice, should be ordered, inasmuch as such a diet is the one that leads to the greatest diminution of the oxalates in the urine. A considerable number of vegetables and fruits, such as peas, onions, lettuce, cauliflower, pears, grapes, peaches, and melons, contain but little oxalates, and may in the majority of cases be also allowed. **Magnesia** is often useful, since it increases the solubility of oxalates, and **Citrate of Potash** is of great value, as it is not only diuretic but tends to prevent the formation of oxalate of lime crystals by forming a soluble double salt.

Bacilluria.—The importance of bacilluria has greatly increased of late years, inasmuch as it is now recognized that this condition is often present and gives rise to symptoms notwithstanding the absence of marked physical signs. Doubtless in a large number of cases some inflammatory affection of the urinary tract, such as pyelitis, pyelonephritis, cystitis, or prostatitis, may be present, but in not a few the condition can only be recognized as the result of a bacteriological examination. Further, in some diseases, especially enteric fever and tuberculous affections, the respective organisms may be excreted in considerable quantities in the urine without the development of any special urinary symptoms. In addition to these cases, where the presence of bacilluria is mainly of hygienic interest, three groups of cases may be recognized (Batty Shaw[2]). In one no marked symptoms are produced, and the health of the individual may be good, yet the examination of the urine reveals the presence of a trace of albumin or of small quantities of pus, and on bacteriological examination bacilluria to a greater or less degree is found to be present. In the second class the patient commonly seeks advice owing to the peculiar odour of the urine, which is often described as fish-like, and is dependent on the formation of various products as a result of the activity of, more especially, the colon bacillus. In the third group some definite inflammatory lesion, such as cystitis or pyelitis, or possibly pyelonephritis, may be present. Cystitis is by far the most frequent lesion.

A considerable number of organisms have been found in cases of

bacilluria, but by far the most frequent is the colon bacillus. Staphylococcal and streptococcal infections also occur, and in rare instances the *Bacillus pyocyaneus* and *B. proteus*. Staphylococcal and streptococcal infections are commonly more serious than those due to the *B. coli*.

Cystitis due to the colon bacillus has been looked upon as dependent both on a descending and ascending affection of the urinary tract. Thus it is frequently associated with follicular enteritis, and this has been regarded by some as evidence of a descending infection. It is supposed that the organism gains access to the blood, and is subsequently excreted by the kidney. Some writers, however, have drawn attention to the frequency with which such colon bacilluria occurs in children, and it has been supposed that the infection is really in such cases an ascending one, and dependent on the soiling of the nates with fæcal matter and subsequent infection of the urinary tract. Further, bacilluria frequently occurs in children in association with threadworms, where a similar mode of infection as a result of the chronic irritation is perhaps possible.

Box[3] draws attention to the frequency with which *pyelitis* may occur in children, and also to the possibility of confounding pyelitis with pneumonia, owing to the sudden onset and severe symptoms which may occur in both affections.

Amongst the more trivial affections associated with bacilluria, incontinence of urine may be mentioned, and it is thought by some that nocturnal incontinence may be due to such a cause.

In the treatment of bacilluria, especially in children, care should be taken to prevent the infection of the urethra from the anus, and any vulvitis present should be treated. Urinary antiseptics are useful, especially in the form of **Urotropin,** but the condition is not always controlled by these drugs. The results of treatment with serum or by vaccination are at present too uncertain for any definite statement to be made with reference to them.

References.—[1]*Clin. Jour.* Jan. 22, 1908 ; [2]*Ibid.* Feb. 12, 1908 ; [3]*Lancet*, Jan. 11, 1908.

URINE, ANALYSIS OF. *Richard Weiss, F.C.S.*

Clinical research now forms so prominent a feature of the routine work of even the general practitioner that new and simplified methods of carrying out the various tests are a matter of great practical interest to the profession. A very complete set of apparatus designed for this purpose has recently been placed on the market by the Roborat Company, of 8, Harp Lane, E.C. The case, which is called the "Quantitest," is of portable leather, and contains all the apparatus necessary for carrying out detailed and exact qualitative and quantitative analyses of both urine and gastric juice. We append notes of the several pieces of apparatus.

The Quantitative Estimation of Sugar.—At the present time the best opinion favours the fermentation method for the quantitative estima-

tion of sugar in the urine, for besides being very convenient, this method yields absolutely accurate results. The "Quantitest" saccharometer (*Fig.* 106) permits of the correct determination of sugar without test solutions, measuring instruments, or trouble, and in a fraction of the time required for other methods. The instrument indicates the amount of sugar in percentages, the graduations being in twentieths per cent up to 1·5 per cent, and in halves from 1·5 to 10 per cent. The apparatus is used as follows: The stopcock is first opened, and mercury poured from above through the graduated tube into the apparatus, until its height corresponds to about the mark 00 on the scale. By means of a special pipette, 0·5 cc. of the specimen is introduced into the bulb and allowed to run on to the mercury. About 5 drops of fresh yeast solution (1 gram to 5 cc. of water) are then added, and, by inclining the apparatus, the top of the mercury column is made to stand exactly at 0. The stopcock is then carefully closed and the apparatus set aside at the ordinary room temperature. The carbonic acid gas evolved will drive the mercury up the graduated tube, and when fermentation is complete the percentage of sugar may be read directly from the scale. Fermentation is usually complete in from four to six hours, but with a warmer temperature (up to 35° C.) only two or three hours are necessary. The apparatus should be cooled to about 20° C. before reading the result, as the scale is adjusted to this temperature. After use, the contents may be poured into a beaker and the fluid portion blotted off with a filter paper. The apparatus and pipette can be easily rinsed with water. The stopcock should be slightly greased after being dried. In order to obtain the number of grains of sugar per ounce of urine, the percentage must be multiplied by 4·375.

The Quantitative Estimation of Uric Acid.—This is very simply done by using the "Quantitest" uricometer (*Fig.* 107) as follows: The tube is filled with carbon bisulphide to the lowest mark *S*, so that the lower plane of the double meniscus is upon the mark *S*. Now add up to the mark *J* a solution of iodine 0·5 gram, potassium iodide 1·25 grams, absolute alcohol 7·5 cc., glycerin 5 grams, and distilled water 100 cc., in such a manner that the upper plane of the double meniscus is upon the mark *J*. The specimen is then added carefully until the colour of the mixture is nearly the same as the colour of the urine which is kept at hand as a control. Insert the glass stopper and shake energetically for fifteen seconds. Add more urine drop by drop, shaking between each addition until the carbon bisulphide is tinted a faint pink. The reaction is now over, and the values pro mille of urine are read on the tube at the level of the fluid. In all, from five to fifteen minutes are needed to make the test. With concentrated urines (over 0·09 per cent uric acid) the reaction takes less time, since after the first quantity of urine is added, often only another drop or two are required to give the colour. If the urine contains less uric acid than the apparatus is able to indicate, add the iodine solution to the mark between *S* and *J*, and water up to the

mark *J*; the final result should be divided by two. If the urine be alkaline, it should be acidified with dilute acetic acid. Where there is a copious deposit of urates the specimen must be thoroughly shaken. The reaction is not affected by the presence of sugar, albumin, excess of pigment, or bile coloration. Specimens containing blood or pus, or large amounts of albumin, must be first coagulated by heating, the urine being then filtered.

The Quantitative Estimation of Urea.—Fill the vertical tube of the "Quantitest" ureameter (*Fig.* 108) with a solution of hypobromite of soda (sodium hydrate 40 per cent 10 parts, bromine 1 part). When the entire tube is filled and the bulb about one-third full, turn the apparatus to the vertical position. Fill the side tube to the zero mark with

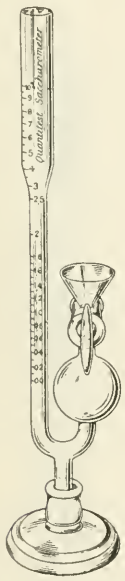

Fig. 106.—Saccharometer.

Fig. 107.—Uricometer.

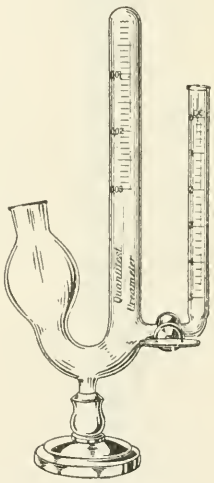

Fig. 108.—Ureameter.

a mixed sample of a 24-hour specimen of urine. Turn the tap and allow one cubic centimetre to pass *very slowly* into the tube. As the urine meets the hypobromite solution the urea is decomposed and nitrogen is set free. The gas collects in the upper part of the tube, where, in a few minutes, the froth and bubbles having subsided, its volume is measured. The figures represent the amount of urea present in the amount of urine decomposed. The amount for the whole specimen can be readily estimated. In cases where the urea content is high, it is well to use equal parts of urine and water; and, when reading off the scale, to estimate the urea as twice the amount indicated.

The Quantitative Estimation of Albumin.—The "Quantitest" albuminometer (*Fig.* 109) is the latest and most accurate instrument yet devised for this important estimation. Its use allows of far greater accuracy than either the Esbach albuminometer or the Purdy tube. The test can be completed within a few minutes. Fill the tube to the mark *R* with a reagent consisting of phosphotungstic acid 1·5 gram, conc. hydrochloric acid 5 grams, and 95 per cent alcohol to 100 cc. Having previously diluted 1 cc. of urine with 9 cc. of distilled water, add the dilution drop by drop, shaking between each addition, until a faint white cloud appears. The reaction is now complete, and the level of the fluid in the tube is noted. This corresponds to the amount of diluted urine that contains one-tenth of a milligram (0·0001 gram) of

Fig. 109.—Albuminometer.

Fig. 110.—Phosphatometer.

Fig. 111.—Uracidimeter.

albumin. The percentage is easily determined. Example: ·8 cc. of diluted urine produced the reaction, and is therefore the equivalent of 0·0001 gram albumin. Then ·08 cc. *undiluted* urine equals ·0001 gram, 8 cc. equals ·01 gram, and 800 cc. equals 1 gram of albumin. The percentage is therefore 800 : 1 :: 100 : per cent, or 0·125 per cent. To obtain the amount of albumin excreted in twenty-four hours:—800 : 1 :: 1600 : *x*, where 1600 cc. is the amount of urine passed in the twenty-four hours.

The Quantitative Estimation of Phosphates.—Collect a 24-hour specimen of urine and carefully measure the total amount. Should this be less than 800 cc., dilute it with double the quantity of water.

Urine of a sp. gr. of 1014 to 1025 must also be diluted with two parts of water. Urine below 1014 is used undiluted. Fill the tube to the mark *U* and add the magnesia mixture to the mark *R* (*Fig.* 110). Put the stopper on and shake for a moment. Allow to stand for eighteen hours, shake again, and let stand for six hours. Read off the figures. Sugar and albumin do not interfere with this test.

The magnesia mixture is made as follows: Magnes. chlor. 5 grams, ammon. chlor. 7 grams, liq. ammon. 35 cc., aqua dest. 65 cc. Shake before using. (This will only keep fourteen days.)

The Quantitative Estimation of Indican.—Fill the "Quantitest" indicanometer with commercial chloroform to the mark *C*, add urine to the mark *U*, and then Obermayer's reagent (2 pro mille solution of ferric chloride in conc. HCl) to the mark *R*. Close the end of the tube with the thumb and shake vigorously for fifteen or twenty seconds. If indican be present, indigo-blue will be liberated and dissolved in the chloroform. Allow the chloroform to settle, and read off the amount of indican present as 0, trace, +, and + +, according to the intensity of the blue colour. This is a very good substitute for the long, tedious quantitative estimation at present used, and will be found to give perfectly satisfactory comparative results.

The Quantitative Estimation of the Acidity of the Urine.—Fill the "Quantitest" uracidimeter (*Fig.* 111) to the mark *U* with a thoroughly mixed 24-hour specimen. Add two drops of phenolphthalein indicator. Add slowly drop by drop an empirical NaOH solution, 1 cc. of which has been made to represent 10 mgrams of phosphoric acid. Invert the tube between each addition. As soon as a permanent red colour appears, the amount of acid present in grams per 1000 cc. may be read at the level of the fluid in the tube.

Quantitative Estimation of the Gastric Juice.—An instrument is now to be had whereby may be made three important quantitative tests: estimation of free hydrochloric acid, total acidity, and combined hydrochloric acid. These results are all obtained by the use of a graduated tube devised for the purpose, and, together with a few physical tests very easily performed, give all the information which is required on the subject. The instrument, termed an "Acidimeter," is a simple graduated tube, and in using it two reagents are required: (1) decinormal solution of sodium hydrate, and (2) an indicator consisting of phenolphthalein and dimethyl-amido-azobenzol (one gram of each) and 70 per cent alcohol 100 cc. Gastric juice is obtained by means of a syphon tube after a test meal and filtered through ordinary filter paper. This is poured into the tube to a given mark, and the addition of two drops of the indicator solution gives a bright cherry-red colour. The decinormal soda is now added drop by drop until the colour of the fluid has changed from red to a distinct canary-yellow. The level is then read off on a scale (marked red), which indicates without any calculation the percentage of free hydrochloric acid present. This being noted down, the test is continued with the same solution by dropping in

more sodium hydrate until the fluid has become permanently red. The level as indicated by another scale (marked yellow) gives the total acidity. Should there be no free hydrochloric acid present, a dirty yellow colour will result on adding the indicator. To find the amount of combined hydrochloric acid, all that is necessary is to repeat the previous test, using as an indicator a one per cent aqueous solution of sodium alizarin-sulphonic acid. The decinormal soda is added drop by drop as before, until a deep violet colour appears. The yellow figures subtracted from the previously determined total acidity furnish the required result, for the total hydrochloric acid is equal to the sum of the free and combined acid.

URINE, RETENTION OF. (*See* ANURIA.)

URTICARIA. *E. Graham Little, M.D., F.R.C.P.*

Finch[1] finds **Creosote** the most useful drug in treating urticaria, and records some remarkable successes with it. The method of administration which he recommends is to give 4-min. doses in capsules, or 2-min. doses in pill form, and thereafter half this quantity every fifteen to twenty minutes in acute cases; in chronic varieties the 4-min. dose may be given after each meal and at bedtime. This treatment may be continued for years. When it fails, **Salicylate of Soda** or **Salol** may be substituted, the last in doses of 5 gr. with 5 min. castor oil after each meal. In very acute and violent attacks an emetic may give rapid relief, or a copious enema. When vomiting is for any reason contra-indicated, **Atropine** and **Nitroglycerin** are very useful: atropine $\frac{1}{150}$ gr. hypodermically in one dose; nitroglycerin $\frac{1}{100}$ gr., also hypodermically, and with permission to repeat the dose. Amyl nitrite by inhalation is especially valuable in cases with much œdema of the face and neck; œdema of the mucous surfaces may be much helped by adrenalin chloride applied locally with an atomizer. For local irritation the application of dilute lotions of vinegar, carbolic acid, resorcin, or thymol is useful.

Scharff[2] recommends in the strophulus of young children a lotion composed of **Ichthyol** in water (5 to 10 per cent), to which is added 5 per cent of glycerin. The child is to be covered with the lotion twice a day and afterwards powdered with potato starch. Gaucher[3] gives the following formula as useful in the itching of urticaria:—

R	Menthol	10	Ether	
	Chloroform		Sp. Camph.	āā 30

REFERENCES.—[1]*Med. Rec.* Feb. 22, 1908; [2]*Centr. f. inn. Med.* Nov. 7, 1907; [3]*Bull. Gén. de Thér.* in *Berl. klin. Woch.* Mar. 10, 1908.

UTERUS, DISEASES OF. *Victor Bonney, M.S., M.D., B.Sc., F.R.C.S.*

Myoma.—An important paper on the present position of abdominal hysterectomy for fibroids in London has been published by Bland-Sutton[1]. In 1896 the mortality of this operation in eight London hospitals was no less than 22 per cent. Ten years later (1906) at the same institutions the death-rate had fallen to but little

over 3. This author discusses many interesting points in connection with uterine myomata. He is not in agreement with those who hold that total hysterectomy is to be preferred to the subtotal operation because of the likelihood of carcinoma developing in the cervical stump left after the latter operation. In spite of his large experience in these tumours, he only mentions one case in which this condition undoubtedly occurred. Such evidence is a welcome reply to certain gynæcologists who make a practice of removing the entire organ for these tumours, a proceeding of considerably greater risk, and, since the cervix is healthy, an undoubted mutilation. On theoretical grounds myoma, being a bar to pregnancy, should act as a protective against carcinoma of the cervix, a disease peculiarly associated with child-bearing, and the experience of those who have seen a large number of these cases supports such a view with increasing force. The added liability to carcinoma of the uterine body which myomata confers is emphasized by the same author. He also lays special stress on the occurrence of thrombosis and embolism after hysterectomy. The frequency of the last disaster varies extraordinarily in the practice of different surgeons. The causation is obscure; probably several factors are at work, such as sepsis, profound anæmia, and cardiac debility. In cases presenting advanced anæmia before operation it is advisable to give 20 gr. of sodium citrate twice a day for some days previously, to diminish the coagulability of the blood.

C. Martin,[2] in the Ingleby Lectures, discusses the symptomatology and treatment of myoma of the uterus. Hæmorrhage, though an almost constant symptom, is rarely directly fatal, but the continued anæmia leads to fatty or fibro-fatty changes in the cardiac muscle, and to degenerative processes in the arteries and veins. These conduce to post-operative thrombosis and embolism, for the occurrence of which, as Martin justly observes, more responsibility rests with those who have delayed the operation than with the surgeon who performs it. Pressure symptoms are frequent, the most frequent viscus to be so affected being the bladder. Thus either retention or undue frequency of urination may result. Lesions of the ovaries and tubes are common accompaniments of these tumours. According to Martin, about one-third of all these tumours are so complicated, though in his own series the proportion was less. Degenerative changes in the tumours and other complications are found in about 20 per cent, of which about 4 per cent are malignant.

Discussing the "natural cure of fibroids," the same author points out that this may occur in three ways: (1) By sloughing or extrusion, or both combined; (2) By involution after pregnancy; (3) By post-menopausal atrophy. The first of these entails many obvious dangers, whilst with regard to the second and third, undoubted cases of actual disappearance after either event are very rarely on record.

As regards non-surgical measures, he says these may be grouped under the heads (1) **Rest,** (2) **Supporting the Uterus,** (3) **Drugs,** (4) **Vaginal Plugging,** (5) **Electrolysis.** Patients with fibroids should

avoid all active exercise at or about the monthly period if they wish to modify the menstrual hæmorrhage that is the leading feature of these tumours. Pessaries are occasionally useful to support small fibroid uteri, and prevent retroversion and impaction. Drugs are unsatisfactory. **Ergot** controls the hæmorrhage in many cases, but at the expense of raising the blood-pressure. As pointed out by Wilson, this is bad for patients suffering from myomatous cardiopathy. Further, it is apt to upset the digestion. I would add to this from my own experience, that its use frequently causes such a degree of abdominal pain, due to uterine contractions, that patients not infrequently object to taking it. Of all the other uterine styptics **Calcium Chloride** is the only one that is really useful, but the author might have added that its use has the disadvantage of increasing the tendency to post-operative thrombosis which is so common a feature of these patients. For this reason it should never be given where an operation is in contemplation. Plugging the uterus is valuable to check otherwise uncontrollable hæmorrhage, but I would add that this proceeding, by retaining blood-clot in the uterus and vagina, is very likely to turn a clean case into an infected one, and so to militate against the success of a subsequent operation. The author rightly dismisses electrolysis in a few scathing words.

Turning to surgical measures, the contraindications and indications are thus summarized: *Contraindications.*—(1) Where the tumour is smaller than an orange and not growing; (2) Where the patient is past the menopause and the tumour is neither growing nor causing trouble; (3) Where the patient is gravely ill from some other condition. *Indications.*—(1) Where there is severe or uncontrollable bleeding; (2) Where there is rapid growth; (3) Where signs of degeneration, necrosis, or malignant disease are present; (4) In many cases complicated with pregnancy; (5) Where there are gross lesions of the ovaries or tubes; (6) Where the tumour is very large or is leading to unfounded suspicions of pregnancy; (7) Where sterility is apparently caused by a tumour removable without the uterus. To these we might add a further indication, viz., where the nature of the tumour is not absolutely certain.

Of the operations, Martin favours **Subtotal Hysterectomy,** which he prefers to the total operation because it is safer for the patient and less difficult for the surgeon. This is the more interesting because this author at one time held a contrary opinion. He does not think that statistics support the objection that the conserved cervix is liable to carcinoma, and in his hands the subtotal operation has had a considerably lower mortality. He also speaks highly of **Abdominal Myomectomy,** which he believes will in time supplant the less conservative operation. This paper is a valuable contribution from a skilled and judicious gynæcologist.

Le Bec[3] reports 100 cases of vaginal hysterectomy for myomata, and praises this method of treatment. He admits, however, to sixteen deaths, which in this country would be rightly regarded as

entirely discrediting the operation. O. v. Frangue[4] reports a series of 201 cases operated on for these tumours. Of those dealt with by the vaginal route, no less than 4·5 per cent became post-operatively infected, but in those removed by the abdominal route only ·55 per cent developed this complication. In this country the preference for the abdominal operation has always been marked, though certain surgeons, influenced by Continental practice, have endeavoured to popularize the vaginal operation. The figures quoted will, it is to be hoped, discourage gynæcologists from endeavouring to remove these tumours through a small wound at the top of a narrow and infected passage instead of rationally selecting the far shorter, easier, and cleaner abdominal route.

Bland-Sutton[5] publishes notes of 101 consecutive cases of hysterectomy for fibroids without a death, and refers to a paper by Clarence Webster[6] entitled "The Irreducible Minimum," in which the latter author draws attention to a series of statistics, drawn from various German clinics, from which the mortality of hysterectomy works out at about 8 per cent, and he pertinently asks if this figure represents the lowest figure attainable. Much depends on the nature of the cases for which the operation was performed. Certainly for fibroids the mortality is very much less in this country—probably about 2 per cent in the hands of skilled operators. But it is to be remembered that the average results of large series of cases cannot be applied rigidly to individual cases. There are certain classes of these tumours in which the mortality would not exceed 1 per cent, or might even be absent altogether. There are others, however, particularly those of long standing in elderly persons, in which a definite death-rate is certain to occur. In short, the prognosis of any given case must be based, not on general statistics, but on its individual peculiarities.

Tracy[7] has analyzed 3561 cases of myomata, from the reports of various surgeons, with special reference to the accidents and degenerations which affect these tumours. He finds that 10·5 per cent of these cases presented some complication which would have directly caused death. The operative mortality was below 5 per cent, the subtotal operation showing by far the most successful results. This is, therefore, the operation of choice.

A survey of the preceding papers shows that the propriety of surgical interference in these tumours is now established, and that, as experience increases, subtotal hysterectomy stands out more prominently than ever as the method of election under ordinary circumstances. This is gratifying to those of us who have taken up a moderate position in regard to the treatment of myomata, neither inclining to useless procrastination, on the one hand, nor ruthless and unconservative surgery on the other.

Carcinoma.—The radical abdominal operation for cancer of the cervix, as devised by Wertheim, is steadily gaining ground in this country. Comyns Berkeley and Victor Bonney[8] have published a series of eighteen cases so dealt with in which three deaths occurred,

Only two of the cases of this series could have been dealt with by vaginal hysterectomy. They state very fully their experience of the operation, as far as they have gone, and lay special stress on its difficulties and dangers. These may be summarized as follows :—

1. *Shock.* This is to be avoided by performing the operation as quickly as possible. Up to an hour and a half most patients bear it well, but after this period every ten minutes makes a great difference to the patient. In their hands the duration of the operation has been from 55 to 165 minutes. This is largely due to the great variance in the difficulty of the proceeding, and in this respect is beyond the control of the operator. Experience and improved technique will, it is hoped, reduce the average time still further.

2. *Septic Infection.* The risk of septic infection of the wound from the putrid vaginal contents in advanced cases is very definite. It is to be avoided by cleansing the growth as far as possible before the operation by means of the cautery and powerful antiseptics, and also by carefully protecting the wound edges by layers of gauze, india-rubber, or oil-silk during the operation itself. The large subperitoneal cavity left by the operation probably always becomes more or less infected. This is of less importance, since it probably tends to extirpate any cancer cells still remaining after the operation.

3. *Cancer Infection.* The two authors named have devised an improved form of vaginal clamp for this operation, which is applied in the antero-posterior vertical plane. The vagina is closed by the approximation of two narrow blades set transversely at a T angle to the rest of the instrument. Its application is much easier than in the case of the forceps originally designed by Wertheim, and it cannot slip off.

4. *Injuries to the Bladder and Ureter.* The first of these is to be avoided by never touching the bladder with the finger or instruments. Its separation from the cervix and vagina is to be effected by swab pressure only. The authors point out that the cancerous hypertrophy of the cervix, by increasing the area of the bladder attachment, stretches and thins the wall of that viscus, so that tears are easily made unless great care is exercised. The ureters are to be protected by leaving intact the peri-ureteral sheath, even in the parametric portion of its course. They had one case of ureteral necrosis which declared itself at the end of a week.

This paper closes with a warm justification of the operation. Autopsies on cases of carcinoma of the cervix teach the remarkable fact that less than 50 per cent of the patients dying from this disease manifest metastases in any situation, but succumb to the sheer effects of the local disease. In this respect, carcinoma of the cervix is a more favourable lesion from the surgical standpoint than carcinoma occurring in any of the other common situations. Wertheim's operation offers a logically better chance for its permanent removal than any of the other surgical procedures which have up to now been practised. The primary mortality will undoubtedly always be

considerable when dealing with advanced cases, but in earlier examples of the disease the operation should be capable of being carried out by skilled hands with a death-rate little if at all in excess of that associated with the less radical measures. Wertheim[9] reported 120 patients operated upon by his method, of whom 58·6 per cent remained free from recurrence at the end of five years. Such a result would be remarkable for carcinoma in any situation, but it is especially in the case of cervical disease, which until lately has been considered as one of the most surgically hopeless forms of cancer. The cases recorded by Berkeley and Bonney are too recent to allow these authors to draw any deductions as to ultimate results, but they point out that there is besides these an immediate justification, namely, the gain in any event to the patient who recovers of a period of hopeful life.

Injuries and Ruptures of the Uterus.—Bland-Sutton[10] has published a lecture on this subject which is of interest. He divides the various forms of injuries into four groups;—

1. *Gynæcological Injuries.* Of these the commonest is perforation by a sound, a dilator, or a curette. When the instrument has been carefully sterilized and the uterine cavity free from infection, this accident is rarely attended with ill results, but in the reverse of these conditions the lesion becomes very serious. When the uterine wall is perforated by a dilator the fact not unfrequently escapes the surgeon's notice, and a quantity of antiseptic solution may be subsequently poured into the peritoneum by the flushing curette. [*In the case of perchloride of mercury, the commonest solution to use in the operation of curetting, this accident is followed by marked shock, severe abdominal pain and tenderness, and, within a few hours, a copious diarrhœa.*—V. B.]. Intestine or omentum may prolapse through the rent, and in some instances have been actually torn or cut off under the impression that they were gestational products.

2. *Obstetrical Injuries.* These comprise the perforations of the uterus caused by version or the use of forceps, and include the spontaneous ruptures due to obstructed labour. A paper by Monro-Kerr[11] is quoted in which this author gives details of twelve cases treated by him, with the following results: By plugging the uterus, three cases, no death: Extraperitoneal hysterectomy, one case, one death: Subtotal hysterectomy, five cases, three deaths: Total hysterectomy, three cases, two deaths.

3. *Injuries to the Pregnant Uterus.* Under this head fall those cases in which the gravid womb is ruptured by falls or blows, or perforated by bullet wounds, or by attempts to procure abortion. Bland-Sutton quotes some interesting cases illustrative of these. He further points out that in certain circumstances the entire gestational products have passed out into the peritoneal cavity with remarkably little discomfort to the patient, and have been subsequently diagnosed as examples of extra-uterine gestation. Such an occurrence is not uncommon in the lower animals, but is very rare in human beings.

4. *Injuries to the Gravid Uterus during Abdominal Operations.* These are not uncommon. Three courses are open: (1) To sew up the incision in the uterus; (2) To perform Cæsarean section; (3) To perform subtotal hysterectomy. The gravid uterus has been tapped in mistake for an ovarian cyst, especially when hydramniotic, and has even been removed under the same delusion.

Hicks[12] has written a valuable paper on *Rupture of the Genital Canal during Labour*, founded on seventeen cases. Concerning spontaneous rupture of the uterus, this author points out that besides some definite obstruction such as pelvic contraction, more or less degeneration of the uterine musculature is also present. Multiparity is the great determining cause. Out of six cases five had borne children already, whilst not one of them presented any grave pelvic deformity. This is important, since the accepted teaching has always made obstruction the first factor in this disaster. The loss of tone in the abdominal wall, due to repeated child-bearing, also predisposes to rupture, both on account of the loss of support, and the fact that a pendulous belly may alter the axis of the uterus even to the extent of causing some obstruction. Precipitate labour due to exceptionally strong uterine action is occasionally the cause of spontaneous rupture. As regards the signs and symptoms of spontaneous rupture, it is important to note that the classical signs premonitory of rupture were as a rule *not present*, nor indeed after the rupture were any very marked symptoms exhibited until after the lapse of some time. In many cases the clinical picture was extremely equivocal and the diagnosis of the condition was not made until some time after the event, and then usually because of the disappearance of the presenting part. Spontaneous rupture is therefore most often quite unavoidable, and should not call for hostile criticism. As regards treatment, Hicks says that abdominal section is a necessity if the fœtus or placenta has passed into the peritoneal cavity. The rent usually involves the anterior wall of Douglas's pouch, and from thence runs up into the uterine musculature and into the broad ligament of one side. The ideal treatment is to suture it throughout, i.e., to convert an intraperitoneal into an extraperitoneal rupture, and then to pack the uterus with gauze from below. Bleeding is not usually severe, but may require hysterectomy to arrest it, or the rent may be so extensive as to necessitate this operation. Traumatic rupture of the uterus during labour is usually due to efforts at version. In most of these cases the fœtus is delivered before the nature of the accident is appreciated. In many cases the symptoms, like those of spontaneous rupture, come on slowly. The treatment of these cases is to plug the rent and uterus with gauze after returning prolapsed gut or omentum into the peritoneal cavity. The gauze plugging should be withdrawn in forty-eight hours. Abdominal section is to be avoided if possible. In the event of the plugging failing to arrest hæmorrhage, a vaginal hysterectomy would probably give the best results.

Uterine Displacements.—A discussion on the treatment of uterine

displacements took place at the annual meeting of the British Medical Association in 1908.[13] The subject was introduced by Herman. This authority considers descent of the uterus as the primary displacement in all the common cases. He believes the pelvic fascia, perivascular sheaths, and levator ani muscle all play their part in the support of the uterus, and considers that mechanical support is the simplest and safest method of treatment in all ordinary cases. In the others, the next best method is usually some form of colporrhaphy or colpo-perineorrhaphy, coupled with the subsequent use of a pessary. If the latter is objected to or contraindicated, Herman advises a ventrofixation operation in which the uterus is united to the fascia of the abdominal wall. He does not think the risk of dystocia is great if the operation is properly carried out and the area of fixation not made unduly large. The uterus should lie after fixation in the axis of the pelvic inlet. In the discussion that followed no two speakers appeared to hold exactly the same views. A number of different operations were described and lauded by their practitioners. On the whole the balance of opinion was on the side of Gilliam's method of intraperitoneal shortening of the round ligaments, combined with some method of narrowing the vagina and vaginal introit.

Fothergill[14] has contributed two valuable papers on the subject of uterine displacements and their treatment. The first deals with purely anatomical considerations as to the mechanism by which the uterus is supported in the pelvis. This author considers that the main retentive apparatus is the perivascular connective tissue surrounding the main vessels of the uterus. In the treatment of prolapse (discussed in his second paper) the object first to be attained is the union in the middle line of the connective tissues which lie on the lateral aspects of the cervix and upper part of the vagina. He speaks highly from the theoretical point of view of the operation described by Donald. This consists of incising the anterior vaginal vault, through which incision, and after the bladder has been freed and displaced upwards, the paravaginal and parametric tissues in the base of the broad ligament are united to and in front of the cervix in the middle line. A triangular portion of the anterior vaginal wall having as its base the original incision and its apex below is also removed. Where the perineum is deficient this is repaired at the same time, and in certain cases hysteropexy is also performed. For vaginal prolapse uncomplicated by descent of the uterus, anterior and posterior colporrhaphy and perineorrhaphy suffice. In pure retroversion not associated with descent of the whole uterus, and not capable of being cured by the use of a pessary, Fothergill favours Alexander's operation in some cases. In others he speaks well of Webster's procedure, the aim of which is to unite the round ligaments of either side in the middle line to and at the back of the uterus. To effect this each is drawn through an aperture in the upper part of the corresponding broad ligament. In the remainder, ventrofixation gives good results.

Giles[15] has analyzed the after results of 136 cases of hysteropexy for uterine displacements with results very favourable to the operation. Improvement in the general condition of the patients was manifested in 85 per cent of the cases. The uterus was successfully maintained in position after the lapse of a year or more in 92 per cent of the cases. Only 5 per cent subsequently required the support of a pessary. In 74 per cent of the cases no troubles with the bladder were present at any time after the operation. Of forty pregnancies following the operation, four had not terminated, ten had miscarried, and twenty-six had borne living children. In only one was any abnormal displacement of the uterus noted. In only two cases did a scar hernia develop. The author maintains on these grounds that hysteropexy may be justly considered as a very valuable method of treatment in cases of prolapse or retroversion.

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VACCINIA.

E. W. Goodall, M.D.

A case of this affection occurring in a horse (horse-pox), which was misdiagnosed as small-pox, is recorded by A. F. Cameron.[1] The patient was a stableman, aged 32. The eruption consisted of eight lesions altogether, of which seven were on the left forearm and hand, and the eighth was on the right forearm. The lesions, which varied in size, resembled those of a primary vaccination about the eighth or ninth day of its development, but were more severe; vesicular rings raised on an indurated and tender base above the level of the skin. Within the ring was a brownish-black crust. There were also severe lymphangitis and enlargement of the axillary glands on each side. The lesions commenced on March 23rd, and the patient was sent to hospital on March 31st. "He stated that for some time before the onset of his illness he had been engaged in treating a horse suffering from 'ulcers of the mouth and throat.' The treatment consisted partly in washing out the mouth, and for the purpose he used an ordinary syringe. The horse's head was raised and held in the usual way. The man held the charged syringe in his left hand, while he pressed home the piston with the right. His left forearm and hand were fully exposed to the stream of fluid returning from the horse's mouth. His right hand and arm were out of the way of the return stream, and were exposed only to the fluid which might splash or trickle along the outside of the syringe. This appears to explain the severe affection of the left arm and the comparative immunity of the right. The attitude of the arms in using the syringe, and the man's habit of keeping his shirt-sleeves rolled above the elbow when at work, probably accounts for the grouping of the lesions below

the elbow, and the complete immunity of the left upper arm. The patient had been successfully vaccinated in infancy and not since. He was vaccinated at the receiving station on three occasions with lymph of two strains known to be potent, but on no occasion did any reaction follow. Consideration of all the circumstances of the case led to the diagnosis of horse-pox."

Cameron refers to a similar case in Vol. x. of the *Clinical Society's Transactions*, reported by John Langton in 1877. But in that case the horse from which the patient was infected suffered from "inflammation of the legs and cracked heels." Boulay, however, in 1863, related a case to the French Academy of Medicine, in which what looked like an aphthous stomatitis in a horse was proved by inoculation to be vaccinia.

Natural cow-pox is seldom met with at the present day. But four cases came under the notice of Alan Green[2] in the spring of 1908. During the middle of March, a farmer residing in Hertfordshire noticed that the teats of several cows in a herd which he owned were cracked. The cracks developed into sores, and twenty-five out of twenty-seven cows were affected. On April 6th the farmer himself observed sore places on his hands. Papules developed on the hands, and a few days later on the forehead and upper lip; the papules were surrounded by considerable inflammation, and there were marked constitutional symptoms. The papules became vesicular, and the vesicles were umbilicated and just like those of severe vaccine vesicles. The farmer's son and two farm labourers who were employed to milk the cows were affected in a similar but not quite so severe a manner. These four persons had not been vaccinated since infancy. Revaccination was performed (after they had been affected with the papulo-vesicular eruption just mentioned), but without success. Inoculation of two guinea-pigs and a calf with some of the fluid obtained from the vesicles in the son's case, produced typical vaccine vesicles. The guinea-pigs were inoculated two weeks later with a highly potent calf lymph without result. It was not practicable to vaccinate the calf. It is highly probable that the disease of the udders from which the four men appeared to have become inoculated, was natural vaccinia; but how the cows became infected was not ascertained.

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VAGINITIS IN CHILDREN.

(*Vol.* 1893, p. 546)—Comby recommends **Sulphur Baths** three or four times a week; **Lotio Hydrarg. Perchlorid.** 1–2000, or **Lot. Acidi Borici Sat.**, several times daily. Suppositories containing **Salol** gr. iss to **Cocoa-butter** gr. xv. may be introduced into the vagina two or three times daily.

VARIOLA. *E. W. Goodall, M.D.*

During the years 1902 to 1904, small-pox was prevalent in Trinidad, having been imported from Yrapa, in Venezuela. An excellent account of the epidemic has been given by R. Schcult. The chief point of interest lies in the extreme mildness of the cases. Of the 5,154 persons attacked, only 28 died, a fatality of 0·54 per cent. Of

the 564 patients treated in the isolation hospital under Scheult's care, 13 died, a fatality of 2·3 per cent. These fatalities are very low; but it is to be remembered that the population is a fairly well vaccinated one. For ten years ending in 1900, the average proportion of vaccinations to births was 83·1 per cent. The protective power of vaccination, however, does not appear to have accounted altogether for the low fatality. Small-pox is a disease which varies much in virulence from time to time. For some years past in certain parts of the United States small-pox of a very mild type has been present, a fact to which attention is drawn by Welch and Schamberg in their work on infectious diseases. These authors state that amongst 138 patients who had not been vaccinated there were no deaths. The fatality of Scheult's 461 unvaccinated patients was only 2·8 per cent. The mildness of the Trinidad epidemic led to much divergence of opinion as to the nature of the disease. Some medical men took the disease to be chicken-pox; others thought it was a disease which was neither small-pox nor chicken-pox ("varioloid varicella"); finally it was shown to be small-pox, a diagnosis which Scheult's paper amply proves. It is extremely doubtful whether there is an epidemic infectious disease like small-pox and chicken-pox, but yet quite distinct from them.

The influence of vaccination was to be seen even though the disease was of a mild form, thus:—

	Vaccinated	Unvaccinated	Total
Abortive	20	21	41
Mild discrete	58	258	316
Severe discrete ..	23	165	188
Confluent	2	16	18
Hæmorrhagic	0	1	1
	103	461	564

There were no deaths amongst the patients who had been vaccinated, whereas there were 13 amongst those who had not.

The age incidence of the patients under Scheult's care also shows the effect of infant vaccination. There were 21 patients under 5 years of age; 14 aged from 5 to 9; 34 from 10 to 14; 85 from 15 to 19; 142 from 20 to 24; 111 from 25 to 29; 64 from 30 to 34, and the rest were above that age. Twelve of the 21 children under 5 were unvaccinated infants whose ages ranged from 2 weeks to 4½ months.

Of 89 pregnant women attacked with the disease, 27 aborted or were prematurely confined; in 20 of these cases this happened after the attack of small-pox was over. In 12 of the 20 cases the fœtuses (including one case of twins) were in the eruptive stage of small-pox, and one had marks on the skin which showed that it had had the disease *in utero*. The same condition was observed in another case where the child was born at full term, the mother being in the convalescent stage of small-pox.

Of Scheult's 564 cases, 514 were negroes, 9 were whites, 40 were of mixed race, and one man was an East Indian.

In no case did Scheult observe any initial rash. As there was at first much doubt about the nature of the disease, vaccination was employed as a means of diagnosis. Scheult "performed 204 primary vaccinations amongst adults and children in the desquamation stage of the disease, or who had practically recovered from it. Of these thirteen did not return for inspection. Of the 191 cases that were inspected, 133 failed to react, 54 reacted slightly to the operation, and 4 seemed to be fairly successful. The slight reaction referred to above consisted in the delayed appearance at the site of inoculation of small red excrescences without any areola, resembling tiny mulberry growths, which dried up without further development. There was no vesiculation. In those in whom the reaction appeared 'fairly successful,' the vesicles were late in appearing and were ill-developed; there was an absence in these cases of the inflammatory zone around the vesicles, and also a lack of general symptoms."

Scheult also revaccinated twenty-five convalescents who showed distinct evidence of previous vaccination: sixteen gave no reaction, four reacted slightly, and one gave a normal reaction. The remaining patients did not return for inspection.

From vaccinations made on children born of mothers who were convalescent from small-pox, Scheult concluded that "the fœtus may acquire a certain degree of immunity from the mother without itself passing through a regular attack of the disease," but that this immunity is of short duration.

Treatment.—As external applications, tepid antiseptic baths, boric acid and zinc ointment, carbolized vaseline or cocoa-nut oil were largely employed. But the application of **Guaiacol** in olive or cocoa-nut oil (1–80) gave the best results. It relieved itching very quickly and hastened the drying up of the pustules.

Reference.—[1]*Proc. Roy. Soc. Med.* (Epid. Sect.) May, 1908.

VERRUGA PERUVIANA. *J. W. W. Stephens, M.D.*

V. Biffi[1] concludes that this disease and Carrion's fever or Oraya fever are different entities. The latter is due to a paratyphus bacillus producing septicæmia during the course of the former affection.

Reference.—[1]*Arch. f. Schiffs u. Trop. Hyg.* 1908, p. 1.

VERTIGO. *William Milligan, M.D.*
D. Lindley Sewell, M.B.

Dundas Grant,[1] in a paper on vertigo and its allied conditions, draws up a scheme for the diagnosis of Ménière's disease and other conditions simulating it. He first distinguishes between vertigo (1) with and (2) without deafness. Nerve deafnesss of sudden onset with intense vertigo is characteristic of an effusion into the labyrinth, i.e., true Ménière's disease. Such symptoms may also be the result of an injury which has given rise to either concussion of, or hæmorrhage into, the labyrinth. The former would be characterized by the gradual recovery of the patient. Ménière's symptoms also occur in cases of

"obstructive deafness," due to pathological changes bringing about fixation of the stapes by which its safety-valve action in relieving momentary increased labyrinthine tension is lost. Suppuration in the middle ear either causing congestion of, exciting pressure on, or extending into and infecting, the labyrinth, originates severe vertigo, which is usually of serious import, necessitating operation.

Vertiginous attacks occur under several other conditions, and they may be grouped according as loss of consciousness occurs or not. Very commonly, if there is distinct loss of consciousness, preceded probably by an aura, the attack must be put down as being epileptic; on the other hand, if the unconsciousness is only momentary, it is more likely due to syncope from some cardiac weakness. The condition known as laryngeal vertigo, in which momentary loss of consciousness is ushered in by a little cough, the writer regards as being usually a syncope.

If there is no loss of consciousness, one must ascertain the effect on the vertigo of closing the eyes. If made much worse, locomotor ataxy must be thought of; if improved, some ocular anomaly, or possibly neurasthenia. If the vertigo is unaffected by closing the eyes, it may depend on indigestion, i.e., toxic vertigo, but Gowers regards gastric vertigo as a very rare occurrence. Other toxic forms of vertigo arise from the abuse of alcohol and tobacco. Increased pulse-tension associated with cirrhotic Bright's disease gives rise to renal vertigo. Cerebral congestion, and the vascular changes associated with the menopause, constitute other causes. When the condition is found associated with headache, ophthalmoplegia, optic neuritis, and paralysis, organic cerebral disease is suggested.

Hysterical vertigo is not rare, and is accompanied by hemi-anæsthesia and diminution in the field of vision. An interesting group is one in which hemicrania shows itself as an intense vertigo accompanied by unilateral headache and scotoma. There is one drug, **Quinine**, which will diminish the sensitiveness of the vestibular nerve, and to produce its sedative action only small doses ($\frac{1}{2}$ gr.) are necessary. This drug will be found the most useful in relieving auditory vertigo. In advanced cases where life is rendered a misery, obliteration of the semicircular canals by operation may be attempted. In cases associated with suppuration in the middle ear, the radical operation often gives the patient complete relief. **Bromides** benefit the epileptic form, and the vertigo of Bright's disease is influenced by **Iodide of Potassium** and a milk and fish diet. For the attacks which sometimes follow severe injuries to the head, small doses of **Perchloride of Mercury** (10 min. of liq. B.P.) have been found most useful.

REFERENCE.—[1]*Clin. Jour.* Oct. 9, 1907.

VISION, DEFECTS OF. *Ernest E. Maddox, M.D., F.R.C.S.*

Astigmatism.—Savage[1] believes that the meridional fibres of the ciliary muscle tilt the lens. His own total astigmatism increased from about 0·5 D in a few years to 2·5 D. Eighteen years previously

to that the ophthalmometer revealed 2·5 D. of *corneal* astigmatism. The explanation of this is probably that his corneal astigmatism was unchanged throughout, and that 2·5 D. was its measure. In his early life this, he believes, was corrected by a tilting of the crystalline lens, which gradually became rectified as years rolled on, leaving at last the corneal astigmatism uncompensated for. Great divergence of opinion exists as to whether partial contraction of the ciliary muscle is possible, the majority of ophthalmic surgeons feeling doubtful of it. That astigmatism is subject to changes in its amount and even in its direction must be a fact familiar to every careful refractionist, but the distortion of the cornea, by varying pressure of the lids, and by differences in the tone of Müller's muscle in the upper lid, sufficiently accounts for the phenomenon. This alteration in the amount of astigmatism was not believed possible some years ago, because it was not then the practice to take account of lower degrees of astigmatism than 0·5 D. It frequently happens that glasses which have cured refractive headache completely become quite unsuitable after a time, necessitating a fresh estimation of the refraction.

Edgar Thomson,[2] of New York, thinks that children frequently learn to overcome low degrees of astigmatism by tilting the head, and thus allowing the lens to become tilted by the action of gravity; but he has not advanced any definite proof of this theory. It is true that the lens is supported less rigidly during accommodation if relaxation of the suspensory ligament take place, so that the truth of the theory is not impossible. The usual mode of detecting lenticular astigmatism is by deducting the corneal astigmatism as measured by the ophthalmometer, from the total astigmatism as found subjectively, or by retinoscopy; but it may be verified immediately by Tscherning's ophthalmophacometer or by Lucien Howe's[3] adaptation of the ordinary Javal Schiötz ophthalmometer, by removing the prism therefrom and placing a small electric light immediately below the axis of the tube. Two reflections are then visible, one large and distinct, from the cornea, the other small but bright, from the posterior surface of the lens. Revolution of the tube with its accompanying electric light causes the latter to describe a circle round the former, if the crystalline lens be untilted; otherwise it describes an ellipse, with its major axis at right angles to the meridian in which the lens is tilted.

Doyne has mounted a pair of *achromatic simple microscopes* on a spectacle frame, each supported by an opaque disc, and finds them very useful for many persons who are nearly blind, and who by holding print very close to the microscopes, so as to obtain great magnification, are able to make it out. They will no doubt be a great boon to many for whom hitherto Berger's binocular loupe or Hesse's binocular and its modifications have been the only practicable aids to reading vision. Hesse's modification of Berger's loupe consists of two strong spheroprisms united by their bases at a slight angle like butterflies' wings, so that each lens shall be perpendicular to the line of vision. The combination is supported by an arm attached to a headband, and

is provided with an electric light. The lenses, however, are not achromatic.

Mention is deserved of the *bimanual ophthalmoscope* introduced by Herbert Tanner. It has a wire attachment above to enable the left hand to steady the instrument, while the hand itself rests upon the forehead, and it may be useful rather to beginners who find a difficulty in giving sufficient steadiness to the instrument. Experienced hands, who use the ophthalmoscope more easily, examining one part of the retina after another, might on the other hand find this instrument hamper their movements a little too much.

Great improvements have been made of late in frameless eyeglasses, which, though slow in coming to this country from America, are now made better in England than anywhere, the "fairy" frames exhibiting perhaps the greatest combination of lightness and strength of any pattern hitherto produced. The reviewer finds that a little beeswax, rubbed on to placquets which are not made of cork, enables them to grip the nose better, and yet in a less irritating way.

Mirror Writing.—Leslie Buchanan[4] (Glasgow), recounts a very typical case of this suggestive phenomenon, to which the above name was given by Buchwald, Erlenmeyer calling it "Left-handed abduction writing." A healthy boy, aged $7\frac{1}{2}$, when beginning to learn writing, began at the top right-hand corner of the page with his left hand, and wrote towards the top left-hand corner, the letters which he formed being reversed as if the copy were viewed in a mirror. After careful education in correct writing, he still occasionally lapsed into mirror writing, and an interesting point was that he did not perceive he had done anything wrong until it was pointed out to him. He sees nothing peculiar about mirror writing, and can read it all easily. Most cases of congenital mirror writing occur in children who are left-handed or ambidextrous. Ireland pointed out that when sixty school children were asked to write their names backwards, five wrote mirror-wise, and were afterwards found to be left-handed. Some mirror writers can, and others cannot, read what they have written.

Previously Pendred[5] reported the case of a child who could write correctly, but if writing on his own account or from dictation, always employed "reversed caligraphy." Edmund Hughes[6] gives his own very interesting history. Originally left-handed, he wrote therewith mirror-wise more easily than *secundum artem* with the right. It was suppressed and almost forgotten till college days, when the left hand writing mirror-wise was found to more quickly follow the thoughts than the trained right hand, and produced without further practice a neat elegant writing, which, however, he could not read without a mirror. He therefore employed transparent paper, which he reversed to read. He considers that during the period of education of the left hemisphere for the right hand the right hemisphere was secretly profiting.

References.—[1]*Jour. Amer. Med. Assoc.* July, 1908; [2]*Ibid.*; [3]*Ibid.*; [4]*Ophthalmoscope*, Mar. 1908; [5]*Lancet*, Jan. 4, 1908; [6]*Ibid.* Jan. 18, 1908.

WARTS.[1] *E. Graham Little, M.D., F.R.C.P.*

The common wart, as it occurs upon the skin, is most frequent in children, and appears to follow a mild local irritation. Internal medicines may be combined with local applications, especially where the warts are numerous. **Arsenic** is the best of these; **Epsom Salts** may also be tried. For local use the following are suggested:—

R	Hydrarg. Chlor. Corrosiv.	1	Collodii Flexilis		25

Paint on wart once a day.

R	Potassii Bichromat.	gr iij	Petrolati		℥j

Rub into the wart at night.

R	Chloral. Hydr.	1	Ætheris		5
	Acid. Salicyl.	4	Collodii		15
	Acid. Acetic.	1			

Paint on wart once a day.

R	Ext. Cannabis Ind.	1	Collodii		40
	Acid. Salicyl.	2			

Paint on wart once a day.

Of other methods of removal, when these fail, **Curetting** is probably the simplest and most efficacious. The wart and surrounding skin are thoroughly scrubbed, and then the wart—and the surrounding skin for about $\frac{1}{4}$ in.—frozen with ethyl chloride; the wart is removed with a sharp curette and dressed with a dry antiseptic dressing.

REFERENCE.—[1] *Jour. Amer. Med. Assoc.* Aug. 22, 1908.

WHITLOW.

(*Vol.* 1908, pp. 76, 82)—This is a condition very suitable for the application of Bier's "**Passive Hyperæmia**" method. The hyperæmia may be induced by a constriction bandage or by suction apparatus, according to the nature of the case. It is claimed that by the use of this means smaller incisions are rendered possible and dressing is less painful.

WHOOPING-COUGH. *Prof. G. F. Still, M.D., F.R.C.P.*

The exact etiology of pertussis remains a mystery; there is no doubt that it is due to some specific infection, but the particular micro-organism is not yet known. Several observers have described short micro-organisms resembling the influenza bacillus. Arnheim[1] claims that one described by Bordel and Gengou is to be regarded as the genuine cause of the disease. It gives an agglutination reaction with the serum of a horse immunized against this bacillus; it closely resembles the influenza bacillus, grows only on media in which fresh serum is present, and is Gram-negative. It was found in the sputum in six out of twenty cases. The supposition is that these bacilli produce some very irritating material in the trachea and other passages, and so produce the paroxysms of cough.

TREATMENT.—It might be expected that the serum of the immunized horse already mentioned would prove of therapeutic value. It has been tried and found wanting. So at present treatment is confined

to less subtle methods. Fendler[2] has found **Intralaryngeal Injections** of a two per cent solution of **Antipyrin** very useful. The child's head is made to rest upon the mother's chest, while the child sits on her lap; the tongue is depressed with a spatula and the fluid is injected with a special glass instillation tube passed backward behind the uvula. With this instrument the injection is said to be easy for the operator, not for the child—whose hands have to be firmly secured; and the results are said to be excellent. One case was cured in seventeen days from the onset of the spasmodic stage, another was cured in a week, and the amount injected varied from 10 to 25 drops daily of the 2 per cent solution, for as many as thirteen days if necessary. The paroxysms diminished in frequency almost directly the injections were begun.

Sheffield[3] insists upon the need for disinfecting the expectorated sputum of children with whooping-cough. He would use:—

℞ Ol. Eucalypti ℥iv | Tinct. Benzoini Co. ad ℥ij

M. ℥j in a pint of hot water to be used for inhalation from a croup kettle three times a day.

While internally the following prescription is useful:—

℞ Ext. Belladonnæ	♏iv	Sod. Bromidi	gr xvj
Vin. Ipecac.	♏xvj	Syr. Amygdalæ	ad ℥ij

℥j to be given to the child every two or four hours, according to the severity of the paroxysms.

Bromoform and **Pertussin** have also been recommended, and Sheffield says that severe paroxysms may be benefited by the inhalation of **Chloroform.** This, however, is not always effectual, as Hughes[1] points out, and even when successful it is only for a few days; then the paroxysms return. He mentions a case in which these were as violent as ever directly the patient had recovered from the anæsthetic, although four days later the cough began to subside rapidly. Tincture of **Grindelia Robusta,** given in ½-dr. doses in sweetened water, has been recommended, also **Fluorine** compounds, namely, an "antitussin ointment," of which an inunction of half a drachm daily is used; and solution of fluoroform. **Codeine** may be given in doses of $\frac{1}{12}$ to $\frac{1}{8}$ gr., or **Heroin** in doses of $\frac{1}{25}$ to $\frac{1}{15}$ gr., or **Chloral** as an enema in doses of 5 to 10 gr. Hughes also mentions codeine or morphine $\frac{1}{10}$ gr., with phenazone 1 to 3 gr. and syrup of tolu 1 dr., to be given three or four times a day. The milk of animals which have been injected with antitetanic serum is suggested. The vapour of **Iodide of Ethyl** may be inhaled. At a later stage of the whooping a prescription of tincture of **Cantharides** 2 min., with paregoric 5 min., and tincture of cinchona 5 min., has been recommended. For the loss of appetite with restlessness at night and intermittent looseness of the bowels, Hughes advises a mixture of sod. bicarb. 6 to 12 gr. with infus. rhei. 2 to 8 dr. three times daily between meals, followed in a few days by a mixture of tincture of hydrastis, sodium bicarbonate, gentian, and

an aromatic, and also a small dose of calomel every third night. At the same time starch and sugar should be diminished in the diet.

Cassidy[5] reports several cases in which the **Abdominal Binder** suggested by Kilmer, of New York, did good. Hughes says that the binder must be well fitting and sufficiently tight, and should be worn day and night throughout. It may be of muslin or of partly woollen material, but it is best made of flannel or linen in front and behind, with some slightly yielding material, such as elastic webbing or stockinette, let into the sides; the back is laced up sufficiently tight to control the symptoms without undue constriction. The width of the binder should be 4 to 8 in., according to age, and the length three inches less than the abdominal girth at the navel. In several of Cassidy's cases vomiting became rapidly less after the binder was applied, and one boy asked to have it replaced on account of the relief which it gave him. Some of the writers mentioned refer to the value of **Fresh Air** for children with pertussis. Sheffield says that except in the presence of grave complications the child should be kept out of doors the greater part of the day, and the rooms constantly aired when he is kept indoors.

REFERENCES.—[1]*Berl. klin. Woch.* Aug. 8, 1908; [2]*Amer. Jour. Obst.* June, 1908; [3]*Ibid.*; [4]*Hosp.* July 20, 1908; [5]*Ther. Gaz.* Sept. 1908.

E. W. Goodall, M.D.

That cats are capable of becoming infected with whooping-cough, and that the sputum and vomit of a patient suffering from the disease contain the infecting agent, seem to be shown by the following experiment which was carried out by Hugh A. Macewen:[1] A full-grown healthy cat was confined in a building far removed from the whooping-cough wards of the Belvidere Fever Hospital, Glasgow. For seven days it was fed with milk with which had been mixed sputum and vomit from uncomplicated cases of whooping-cough. At the end of that period it was fed on ordinary milk. Fourteen to seventeen days later the animal began to grow languid, to lose its appetite, and to take little notice of what went on around it. A month from the beginning of the experiment a choking cough, followed by vomiting, set in. Later the cough became spasmodic, and was accompanied by a well-marked whoop, "which even persons unacquainted with the nature of the experiment at once pronounced to be whooping-cough. When these spasms came on, the animal, rising and clinging to the bottom of the cage with its claws, coughed and whooped in a manner which left no doubt as to the nature of its complaint."

REFERENCE.—[1]*Brit. Med. Jour.* Jan. 18, 1908.

WRY-NECK. *Priestley Leech, M.D., F.R.C.S.*

R. P. Rowlands[1] describes a method of treating wry-neck by means of lengthening the sternomastoid muscle in place of dividing its attachments. As in any case it is much better to divide the muscle, etc., by an open wound, it is wise to take advantage of the wound by

doing a complete and accurate examination. Every care must be taken to prevent the accumulation of blood in the wound and septic infection, as these are two additional causes of the formation of an excessive amount of fibrous tissue. The technique of the operation is as follows: A curved incision is made across the lower end of the sternomastoid, which is carefully separated from the vessels beneath it. The sternal tendon is detached from the bone and separated from the clavicular fibres, which are then divided obliquely upwards and backwards. The dense and shortened deep layer of the sheath of the sternomastoid is dissected away from the carotid sheath, and all of it that can be exposed is excised to prevent reunion and recontraction. The fascia covering the scalenes and the elevator anguli scapulæ may resist extension and require division: the deformity is over-corrected, any muscles being kneaded that may require it. While the position is over-corrected, the two heads of the sternomastoid are sewn together with catgut sutures without any tension. All bleeding is arrested, and the wound dried and closed. The head is bandaged in the over-corrected position, and a few days later an apparatus is applied. This consists of two bands of strong webbing sewn together, one passing under the lower jaw and over the top of the head, the other going round the forehead and the occiput. Each strap is tightened by means of a buckle, and to the horizontal one a ring is attached above the left mastoid bone. From the ring a strong rubber accumulator is stretched behind the back obliquely downwards and to the right side of a fixed waist-belt. This maintains the over-corrected position of the head. In many cases the trapezius needs division, and this can be done near the skull where the scar becomes hidden by the hair.

REFERENCE.—[1] *Pract.* Sept. 1908.

YAWS. *J. W. W. Stephens, M.D.*

A. Castellani[1] describes the spirochæte (*Spirochæta pertenuis*) first recorded by him on June 17th, 1905. Its length is 18 to 20 μ. It is very thin. It stains well by Leishman's stain provided the alcoholic solution is allowed to act for five minutes and the water (subsequently added) for one to several hours. It also stains well with Giemsa's stain. The ends as a rule are pointed, but may be blunt. The number of undulations is six to twenty and upwards. The spirochæte is practically constant in the eruptive lesions of yaws and fairly frequent in the ulcerated ones, but is there mixed with coarser spirochætes. The fact that *S. pertenuis* is the only organism present in non-ulcerated papules, in the lymphatic glands of yaws patients, and in monkeys inoculated with the disease, is in favour of the spirochæte being the specific cause of yaws.

A. Robertson[2] recommends washing the patient night and morning with **Carbolic Soap,** and **Ung. Hydrarg. Nit. Dil.** (1–3 vaseline) is then applied to the papules. **Potassium Iodide** is given three times a day in doses of 10 to 20 gr. to adults and 2 to 5 gr. to children. For

anæmia and debility, iron citrate or syrup of iron chloride with cod-liver oil or petroleum emulsion are given in addition to the iodide. When the yaws are on the feet, softening the skin with carbonate of soda solution and scraping it with a Volkmann spoon forms the best treatment. In the Gilbert and Ellice islands extensive necrotic processes, e.g., of the palate, the author considers are due to syphilis and not to yaws.

A. Castellani[3] says for ordinary cases the best routine treatment is **Potassium Iodide** in large doses (3 to 4 grams daily). In severe and persistent cases a mixed treatment is advisable, i.e., a course of iodides followed by **Atoxyl** or **Cacodylate of Sodium** or **Quinine** subcutaneously. The skin is washed night and morning with mercury perchloride (1–1000) solution. Ulcerated lesions are dusted with iodoform or boric acid. In other cases protargol (20 per cent) ointment is used. Phagedænic ulcers should be treated with pure carbolic acid.

The same writer[4] gives a detailed description of the symptoms, pathology, and treatment of yaws as seen by him in Ceylon.

The *Primary Lesion* is a papule, which, after about a week, secretes a yellowish fluid which dries into a crust. If the crust is removed, an ulcer with clean-cut edges and granulating base is displayed. This ulcer may heal or become granulomatous, resembling the secondary lesion. This is the "mother yaw." The proximal glands may be enlarged and hard. This primary sore may develop on any part of the body; it lasts weeks or months, and is generally present when the secondary eruption appears.

Secondary Eruption.—This begins one to three months after the first appearance of the primary sore. Minute "pinhead" papules appear on various parts of the body. After some weeks most of these disappear. Some of the larger ones form large granulomatous nodules covered with a yellowish crust formed of dried secretion. They occur on almost any part of the body, especially the limbs and face. They may remain unchanged for months, or may become hard and covered with wart-like protuberances. The majority disappear in six to twelve months. Besides the typical granuloma of the secondary stage, papular, scaly, and ulcerative lesions occur. There are also peculiar irregular white patches, consisting of conical papules, especially on the arms and back. On the palms a peculiar pitted appearance results from the pre-existence of papules. On the tongue whitish patches resembling syphilitic leukoplakia may be seen. The joints—one or more—may become swollen in a way suggesting articular rheumatism, but sodium salicylate has no action, whereas potassium iodide has. Multiple periostosis of the digital phalanges—"multiple dactylitis"—is commonly seen. Neuritis of the sciatic nerve is not uncommon. Hyperidrosis was seen by the author in several cases, the condition yielding to potassium iodide. Iritis was seen by the author twice, with photophobia, ciliary congestion, and discoloration of the iris.

Tertiary Lesions.—These consist of gummatous nodules and deep ulceration. When in the skin they give rise to clean-cut ulcers with a

fungating base, or very irregular ulcers with thick undermined edges, or large fungating ulcers. Osseous lesions are common, taking the form of painful nodes under the periosteum, or a diffuse chronic periostitis leading to deformity.

Finally, the author has succeeded in infecting monkeys with yaws, by scarifying the skin with the scrapings of a yaws papule, and also with blood taken from the vein of a yaws patient. Monkeys infected with yaws are still susceptible to syphilitic infection, and vice versa. The yaws lesion in monkeys is generally confined to the seat of inoculation, but the infection is a systemic one, as shown by the detection of *S. pertenuis* in the spleen and glands. The author considers that further research will show that yaws is hereditary, though it is interesting to note that parents generally contract the disease from their children.

A. Neisser[5] holds that yaws and syphilis are distinct diseases, although clinically and in other respects they are closely allied. Thus (1) Yaws and syphilis are both caused by spirochætes; (2) Both diseases are acted upon by the same specific agents, viz., iodine and atoxyl, while yaws reacts less to mercury; (3) Apes react on inoculation in a similar way to both diseases, e.g., with typical primary lesions; (4) Yet the author holds that the diseases are different, because (*a*) yaws does not protect against syphilis, (*b*) syphilis does not protect against yaws.

References.—[1]*Brit. Med. Jour.* Nov. 23, 1907; [2]*Ibid.* Nov. 5, 1907; [3]*Lancet*, Nov. 23, 1907; [4]*Jour. Cutan. Dis.* Ap. 1908; [5]*Arch. f. Schiffs u. Trop. Hyg.* 1908, No. 6.

Part III.—Miscellaneous.

SANITARY SCIENCE, 1908.

By JOSEPH PRIESTLEY, B.A., M.D., D.P.H.,

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A PURE MILK SUPPLY.

Much attention has been devoted, both inside and outside Parliament, to the need for further legislation to control the national milk supply and to render it pure. The need for a new general Act is acknowledged by all, in order to secure increased powers for the central authorities, whilst, at the same time, the legion of local enactments (piecemeal and voluntary), which at present exist, shall be done away with. A general Act for the country, as a whole, is needed, dealing with home produce, but attention must also be paid to milk supplies imported from abroad. International legislation is, therefore, needed as well.

The whole subject is a far-reaching one. There are the conditions under which the milk is produced, e.g., the state of the cowhouses and cowsheds, shippons, etc., the food and health of the cows themselves, etc., pointing to the need for constant and careful sanitary and veterinary inspections. The present conditions under which, in some instances, cows are housed in the country, beggar description, from a point of view of bad sanitation. Then there is the important question of the storage and carriage of the milk from the country into the towns —the present methods of railway transit being far from satisfactory. Finally, there is the last stage, the keeping of the milk by the consumers under such insanitary and filthy circumstances as to ensure it being more or less contaminated and polluted. The Trade will welcome new legislation, provided it be just and equitable, and applicable to all at home and abroad. At present, matters are in a chaotic state. The Dairies and Milkshops Orders 1885–86 have been satisfactorily carried out in some places, but not in others; different authorities have overlapping jurisdiction; local increased Parliamentary powers have been conferred upon some districts but refused to others; and so on.

The question of pasteurization and sterilization of milk is intimately connected with the subject of a pure milk supply, and during the past year has been discussed on several occasions. There appears to be general agreement that, by pasteurization, it is possible to reduce the micro-organisms present in raw milk by between 70 and 90 per cent, and to destroy, or, at least, render harmless, the specific organisms of tuberculosis, diphtheria, typhoid, cholera, etc. Further, the "keeping" properties of the milk are increased and extended in duration, thereby rendering the use of harmful chemical preservatives unnecessary. Even though the nutritive value of the milk may be

impaired by pasteurization (and still more by sterilization), this disadvantage is more than counterbalanced by the above-mentioned advantages of such processes. Pasteurized or sterilized milk is dearer, whilst people prefer raw milk to drink.

BENZOIC ACID AND BENZOATES AS FOOD PRESERVATIVES.

Dr. H. W. Wiley, of the United States Department of Agriculture, has published during 1908 the results of his experiments conducted to determine the effects of benzoic acid and benzoates upon health and digestion. Benzoic acid occurs naturally in many food products, especially in cranberries, where the amount is large.

The results of the experiments show that both benzoic acid and benzoate of soda, when administered to healthy young men in quantities used in the experiments (1–2 grams per day), speaking generally, produce marked symptoms of discomfort and malaise, the most common symptoms being nausea and headache, together with loss of weight. Elimination of the preservative takes place through the kidneys. The ingestion, therefore, of benzoic acid or benzoate of soda is highly objectionable, and produces a very serious disturbance of the metabolic functions, attended with injury to digestion and health, even in healthy adults. There is also loss of weight, indicative of either a disturbance of assimilation or an increased activity in those processes of the body which result in destruction of tissue. Dr. Wiley concludes by stating that, "in the interests of health, both benzoic acid and benzoate of soda should be excluded from food products, being, when added thereto, injurious to health."

GAS *v.* ELECTRIC LIGHT, HYGIENICALLY CONSIDERED.

The use of electric light is becoming so general that it may be useful to record the opinion now held as to its advantages (if any) over gas lighting, either directly or indirectly. Dr. S. Rideal published during 1908 the results of an investigation carried out under his direction, dealing with the matter very fully from a physiological, chemical, and physical standpoint. It has long been known that light from gas combustion is accompanied by heat, water vapour, carbonic acid and other products, whereas, in the case of electric lighting, it is the general opinion that there is no combustion, and, therefore, chemical products are absent. The yield of heat by electricity is about one-half of that by gas. The conclusions arrived at by Dr. Rideal from his experiments may be tabulated as follows :—

1. Composition of the air under gas illumination, owing to the better ventilation obtained by gas, showed no marked difference from that under electricity, and the condition of the room, as regards heat and moisture, was practically the same under both illuminants.

2. With natural ventilation, the proportion of carbonic acid in the air was practically identical for both illuminants.

3. The temperature and moisture never reached a point at which any prejudicial effect upon the well-being of the occupants of the rooms could be detected by any recognized physiological tests.

4. The choice between the two systems of lighting does not depend upon hygienic considerations.

NEW INSTRUCTIONS TO MEDICAL OFFICERS OF HEALTH.

The Local Government Board, in connection with the Annual Reports of Medical Officers of Health, point out during 1908 that the Board has been approached by the Board of Agriculture and Fisheries as to the desirability of making arrangements for the notification of cases of glanders, anthrax, and hydrophobia in man, where the facts point to the possibility of infection having been derived from an animal or its carcase, or where enquiry under the Diseases of Animals Acts seems to the medical men concerned to be *primâ facie* desirable. Further, that the Board are satisfied as to the advantage of such an arrangement with a view to checking the spread of these diseases; and ask that medical officers be invited to intimate in future to the clerk of the Local Authority under the Diseases of Animals Acts of their respective districts such cases or suspected cases of glanders, anthrax, or hydrophobia in man as may come to their knowledge—applications for notification of these diseases under Sections 55 and 56 of the Public Health (London) Act, 1891, to be favourably entertained by the Board. Outbreaks of glanders and anthrax are to be notified to the Medical Officers of Health under paragraph (3) of the article I of the Anthrax Order of 1899, and article 4 of the Glanders and Farcy Order of 1907.

PRESERVATIVES IN CANNED AND TINNED MEATS.

The Report of Dr. A. W. J. MacFadden, of the Local Government Board, has been published during 1908, and shows that there is still room for improvement in connection with canned or tinned meat sent over to England by the United States and other countries. It follows, therefore, that the Federal Meat Inspection Law of the United States has not proved, in practice, as successful as was anticipated. Indeed, Dr. MacFadden states that "our position, as far as safeguards provided by American Law are concerned, is apparently much as it was before the enactments came into force." The results of the analyses carried out by the Board may be tabulated as follows:—

Corned beef { Boron preservatives found in 8·1 per cent.
Sulphite preservatives found in 6·4 per cent.

In the majority of cases, the amounts of preservatives found were small—indeed, so small as to be practically of no preservative value, showing that the source was, probably, some of the meat used by the canners.

REGULATIONS AS TO IMPORTED MEAT AND FOOD.

The Local Government Board have, during 1908, drafted two sets of regulations in regard to (*a*) foreign meat, and (*b*) unsound food (first series), in pursuance of the powers vested in the Board by Section 1 of the Public Health (Regulations as to Food) Act, 1907, dealing with the power of making regulations authorizing measures to be taken for the prevention of danger to the public health from the importation, preparation, storage, and distribution of articles of food or drink intended for sale for human consumption. The Regulations came into force on January 1st, 1909, and October 1st, 1908, respectively, and appeal is given to the Local Government Board under both sets.

Under (*a*)—the Foreign Meat Regulations—the Officer of Customs

examines ships with a view to ascertaining whether the cargoes comprise any foreign meats classed as Class I., Class II., Class III., or foreign meat unclassed. If Class I or Class II., notices must be given to the masters of the ships and to the importers that such meats shall not be removed from the ships, or shall not, if already delivered overside or landed, be removed from the places of delivery or of landing, or from any other places which the Officers of Customs specify in the notices, until the meats have been examined by the Medical Officers of Health concerned. If Class III., or foreign meat unclassed, the Officers of Customs may allow the meats to be removed from the ships without any such examination, unless they have reason to believe that such meats require examination. Meats of the different classes are defined in the Regulations (Article I.). The Medical Officers of Health have power to stop the meats in transit, and to order their exportation, giving notice to the Sanitary Authority, who shall within twelve hours notify the importer that, unless within twelve hours he gives a written undertaking that he will export the meat at his own expense, or, in proceedings before a justice, prove that the meat is not intended for sale for human consumption, the meat will be destroyed.

Under (*b*)—the Unsound Food (First Series) Regulations—Medical Officers of Health are empowered to examine any articles of food which have been landed within the districts of Sanitary Authorities, or whilst on board ships within the districts, if, in their opinion, the circumstances so require. If such food is unfit for human consumption, the Medical Officers of Health may cause it to be carried away, or may forbid its removal until it has been examined by a justice, who may condemn the food and order it to be destroyed, provided there is no proof that the food is not intended for human consumption.

Power to take samples is given in the case of particular consignments, in which it is necessary that special examinations should be made (e.g., in the laboratory), and in this connection provision is made for the temporary detention of consignments pending the completion of such examinations.

SCHOOL CLINICS.

The results so far of the experience gained in connection with the Medical Inspection of School Children, carried out under the Education (Administrative Provisions) Act, 1907, section 13, may be summed up in the two words "School Clinics." All are agreed as to the absolute necessity for proper provision being made for the medical treatment of school children—a conclusion arrived at as the result of what has been found actually amongst the children inspected, e.g., defective teeth, defective vision, diseases of the throat, nose, and ears, adenoids, debility, skin diseases, tuberculosis, etc. In this connection, an important Report has been published during 1908 by the Special Sub-committee of the Education Committee of the London County Council, and the findings in the Report deserve the serious attention of all Education Authorities. The reference to the Special Sub-committee was the question of the medical treatment of children attending public elementary schools, and the sub-committee was representative, not only of the Education Committee of the Council, but also of the medical and dental professions and important institutions

concerned with medical and surgical treatment. The children are grouped into three classes :—

1. Those requiring care in an institution and outdoor life, i.e. : (*a*) Debilitated children ; (*b*) Children convalescent from tuberculosis, treated surgically ; (*c*) Children suffering from subacute or early tubercular disease.

2. Those requiring operative and in-patient treatment.

3. Those who can be promptly and adequately dealt with in suitably equipped rooms, e.g., children suffering from *teeth* defects and simple diseases, *eye* defects and simple diseases, *skin* diseases (chiefly parasitic, e.g., ringworm, scabies, pediculosis, etc.), *ear* defects and simple diseases, etc.

The provision necessary for each of these classes may be tabulated as follows : for (1.) Residential schools, and institutions intermediate between the hospital and the special schools ; for (2.) Existing hospitals, and home treatment by medical practitioners ; for (3.) Special school surgeries or clinics, at which treatment can be provided by the officers of the Education Authority, or special arrangements with existing hospitals and dispensaries (with financial help from the rates).

For efficiency and economy, the Sub-committee report in favour of the establishment by the Education Authority of special school clinics at suitable centres throughout the District of the Authority, for the medical treatment of the defects mentioned in class 3—the requirements for classes 1 and 2 being met satisfactorily by existing private and hospital practice for operative and in-patient treatment. This report of the Sub-committee receives the approval of the British Medical Association, on the grounds that any State medical service must be adequately organized, must be administered on a systematic basis, and must be clearly distinguished from work undertaken for charitable motives.

The alternative scheme in connection with the treatment of children in class 3 is to make use of existing hospitals and dispensaries, subsidies being granted from the rates where necessary, and this scheme is put forward as a minority report by the representatives of the Charity Organization Society. In cases of certain mental and physical deficiency, education under special conditions in special schools is needed.

The experience in practice gained at Bradford is interesting. A school clinic has been started there by the Education Authority with the approval and consent of the Board of Education, with the following limitations : "To treat minor ailments, such as sores, sore eyes, discharging ears, ringworm ; to test the eyesight of children believed to be suffering from defective vision, and for prescribing appropriate spectacles (in certain cases, free of cost, or at a reduced rate, to the patients)." These conditions follow the lines laid down in Circular No. 596 of the Board of Education. The Clinic has been working six months, dealing with about 350 children up to date. Its advantages are reported to be unquestionable—children getting treated who, were it not for the School Clinic, would remain untreated. Parental medical neglect is a thing of the past. "The Bradford School Clinic," in the words of Dr. Crawley, the Medical Superintendent to the Bradford Education Authority, "connects up so intimately medical inspection and treatment. Cases which are classified as 'uninteresting' at the

out-patients' department, and which no one troubles to follow up, are of special concern to the School Medical Officer, and he has the necessary machinery at hand to see that they are not neglected. The interest of the work is added to considerably." (See also *Medical Annual*, 1908, pp. 620–622.)

SEWAGE DISPOSAL.

The Royal Commission on Sewage Disposal is still sitting, and during 1908 has published a Fifth Report, dealing clearly with the present position of the sewage purification problem. The Commissioners have satisfied themselves that it is practical to purify the sewage of towns to any degree required, either by land treatment or by artificial filters, and that there is no essential difference between the two processes, for in each case the purification, so far as it is not mechanical, is chiefly effected by means of micro-organisms. The two main questions, therefore, to be considered in the case of a town proposing to adopt a system of sewage purification are, (1) What degree of purification is required in the circumstances of that town, and of the river or stream into which its liquid refuse is to be discharged; and (2) How the degree of purification required can, in the particular case, be most economically obtained. The admixture of trade refuse with the sewage does not make it impracticable to purify the sewage either upon land or by means of artificial processes, although in certain extreme cases special processes of preliminary treatment may be necessary.

The Report goes on to state that the ultimate objects to be effected in the purification of sewage are the removal of the suspended matters, and the oxidation of the remaining organic matters and ammonia —the former process by means of screens, grit or detritus tanks, and sedimentation tanks, the latter (a biological process) by passing the sewage through some form of artificial filter bed, or applying it to land; whilst sewage filters, when working properly, are not likely to provide breeding grounds for pathogenic bacteria, although they may allow a certain number to pass through them. Further, as a preliminary process, it is desirable to remove all, or a considerable portion of, the suspended matters, and this is effected by septic tanks, continuous flow settlement, or quiescent settlement with or without chemicals.

Other important matters are also dealt with in the Report, e.g., standards for sewage effluents and the tests connected therewith, the desirability of establishing a Central Authority, etc.

THE TUBERCULOSIS PROBLEM.

A great advance in connection with the prevention of tuberculosis has been made during 1908 by the Local Government Board, who have issued an Order in pursuance of Section 130 of the Public Health Act, 1875, as amended and extended by the Public Health (London) Act, 1891, and the Public Health Act, 1896, to provide for the notification to the Medical Officers of Health of Sanitary Authorities of cases of pulmonary tuberculosis occurring among the inmates of Poor Law Institutions, or amongst persons under the care of District Medical Officers, and for the taking of certain measures in such cases. The

date of the Order is Dec. 18th, 1908, and it came into force on Jan. 1st, 1909.

Notification on special printed forms by Medical Officers of Poor Law Institutions, and by District Medical Officers, becomes respectively compulsory within forty-eight hours after their first recognition of the symptoms of pulmonary tuberculosis in the cases of (*a*) Poor persons (who are inmates of Institutions) by the former to the Medical Officers of Health for the sanitary districts in which such persons resided immediately before they became inmates of such Institutions; and (*b*) Poor persons (who are in receipt of Poor Law medical relief) by the latter to the Medical Officers of Health for the sanitary districts in which such persons reside. Further, superintending officers of Poor Law Institutions, and relieving officers, have to notify within forty-eight hours to the Medical Officers of Health concerned, on special printed forms—the former, the actual or intended place of destination and address at that place of all persons leaving the Institutions in respect of whom notifications have been made by the Medical Officers of such Institutions; and the latter, any changes of address (other than by admissions into Poor Law Institutions) of persons in respect of whom notifications have been made by District Medical Officers.

The remuneration is: (1) For Medical Officers, one shilling for the first notification, and sixpence for every subsequent notification of any one case to the same Medical Officer of Health; and (2) For superintending Officers and Relieving Officers, threepence for every notification. The remuneration is to be paid in the manner and subject to the conditions of the Order by the Councils of the Sanitary Districts for which the Medical Officers act, and it will be deemed to cover the cost of postage.

There is an appeal under the Order to the Local Government Board. It is noted in the Order that nothing therein shall have effect so as to apply to or to authorize anyone to put in force, with respect to a person in relation to whom a notification has been made, any enactment which renders him or any other person liable to a penalty or subjects him to any restriction, prohibition, or disability affecting him or his employment, occupation, means of livelihood, or residence, on the ground of his suffering from pulmonary tuberculosis. The printed notification forms are to be provided by the Poor Law Authorities. (See also *Medical Annual*, 1908, pp. 625–6.)

TYPHOID FEVER AND STORAGE OF WATER.

Dr. A. C. Houston, of the Metropolitan Water Board, has during 1908 issued an important report on research work, dealing with the vitality of the typhoid bacillus in artificially infected samples of raw Thames, Lea, and New River water, with special reference to the question of storage. He shows that, under storage, a change occurs in river water, so that such water becomes thereby relatively, if not absolutely, "safe" as far as the typhoid fever bacillus is concerned. This storage must be sustained, but whether for a few days or a few weeks is not yet decided. In any case, the use of raw unstored river water for filtration purposes is risky, and a few weeks (say, four) should be insisted upon, as far as possible, as the *minimum* time of storage required. River water, properly stored and afterwards filtered, is harm-

less, as far as danger from typhoid infection is concerned. Apart from this, Dr. Houston's previous report proved that the most recent tests for *Bacillus typhosus*, applied to a considerable volume of raw river water, at weekly intervals, during a period of twelve months, and involving the study of 7320 microbes, failed to reveal the presence of a single typhoid bacillus; but that it would be altogether presumptuous to infer from these observations that the typhoid bacillus is never present in the raw river waters, or to conclude that any relaxation in the processes of purifying the raw waters, by storage and filtration, before delivery to consumers, is justifiable.

TYPHOID FEVER CARRIERS.

The interesting question of typhoid carriers has been much to the fore during 1908. It is recognized that patients, who have suffered from typhoid fever, may have the germs of the disease left in their bodies, e.g., in the intestines, the gall-bladder, and the urine, for long periods after they are pronounced convalescent, and, presumably, free from infection. The gall-bladder theory is the explanation offered officially in connection with a localized outbreak of typhoid fever, consisting of 126 cases (eight deaths) in Glasgow and neighbourhood. Milk became infected, with the result that the epidemic or outbreak occurred. Enquiries show that 500 households were affected in that they consumed the infected milk, that the 500 households consisted of 2500 persons, that the attack-rate was from 4 to 5 per cent, whilst the case fatality was 5·5 per cent. Bacteriologically, the source of the disease was traced to a woman milker who had had an attack of enteric fever sixteen years previously, and had since been, on several occasions, associated more or less clearly with outbreaks of illness which proved to be enteric fever. The typhoid bacilli were found in her dejecta (5000 per cubic centimetre), and her blood gave a positive Widal reaction. The chain of evidence was complete, showing the outbreak of typhoid as caused in the first place directly from the milker, and afterwards indirectly. Chronic typhoid carriers have been found at periods varying from a few weeks to as much as forty years after the attack of the fever. In some cases there were no clinical symptoms of typhoid fever, but, in this connection, the disease is often so slightly characteristic as to be unrecognized as typhoid, but simply regarded as influenza, pneumonia, meningitis, etc. Of the chronic typhoid carriers, women form by far the larger proportion (about 75 per cent), the bacilli finding a habitat in the gall-bladder, passing down at intervals into the intestines, to be voided with the stools.

The subject is one requiring the serious and careful attention of Public Health administrators. (See also TYPHOID FEVER AND STORAGE OF WATER.)

UNSOUND FOOD.

An important report, issued during 1908 by Dr. G. S. Buchanan, Inspector of Foods to the Local Government Board, has drawn attention to certain imported meat foods of questionable wholesomeness, e.g., imported fresh or frozen boneless scrap meat; imported pork (in regard to tuberculosis); and imported tripe, tongues, and kidneys,

which are heavily dosed with boric acid and other preservatives (even as much as 60 to 150 gr. of boric acid per lb.). Dr. Buchanan suggests that the conditions of the trade indicate the desirability of action being taken by the Local Government Board under the Public Health (Regulations as to Foods) Act, 1907, so as to prevent the introduction from abroad at English ports of tripe (cooked or uncooked), tongues, and kidneys, which arrive in receptacles containing any preparation consisting of or comprising boric acid, borax, or other borates, sulphurous acid or sulphides, or other preservatives such as formalin, benzoic acid (or benzoates), salicylic acid (or salicylates), or fluorides.

THE WHISKY COMMISSION.

A Royal Commission has been appointed during 1908, under the chairmanship of Lord James of Hereford, with the instruction to enquire and report :—

1. Whether, in the general interest of the consumer, or in the interest of the public health, or otherwise, it is desirable : (*a*) To place restrictions upon the materials or the processes which may be used in the manufacture or preparation in the United Kingdom of Scotch Whisky, Irish Whisky, or any spirit to which the term "whisky" may be applied as a trade description ; (*b*) To require declarations to be made as to the materials, processes of manufacture or preparation, or age of any spirit ; (*c*) To require a minimum period during which any such spirit should be matured in bond ; and (*d*) To extend any requirements of the kind mentioned in the two sub-divisions immediately preceding to any such spirit imported into the United Kingdom.

2. By what means, if it be found desirable that any such restrictions, declarations, or period should be prescribed, a uniform practice in this respect may be satisfactorily secured ; and to make the like enquiry and report as regards other kinds of potable spirits which are manufactured in or imported into the United Kingdom.

The Commission has already issued an Interim Report, in which the following conclusions have been arrived at :—

1. That no restrictions should be placed upon the processes of, or apparatus used in, the distillation of any spirit to which the term "whisky" may be applied as a trade description.

2. That the term "whisky" having been recognized in the past as applicable to a potable spirit manufactured from (*a*) malt, or (*b*) malt and unmalted barley or other cereals, the application of the term "whisky" should not be denied to the product manufactured from such materials.

The Commissioners reserve for further consideration the question of the advisability or otherwise of attaching special significance to particular designations, such as "Scotch Whisky," "Irish Whisky," "Grain Whisky," and "Malt Whisky ;" of placing restrictions upon the use of such designations as trade descriptions ; or of requiring such designations to be used in connection with the sale of whisky.

LEGAL DECISIONS

AFFECTING MEDICAL MEN AND THE PUBLIC HEALTH.

By JOSEPH PRIESTLEY, B.A., M.D., D.P.H.

Medical Officer of Health, Metropolitan Borough of Lambeth.

ADULTERATION OF FOOD AND DRUGS.

ELDER *v.* DRYDEN (King's Bench Division).

Sale of Food and Drugs Act, 1875, ss. 6, 21—*Sale of Food and Drugs Act*, 1899, s. 4 (1)—*Milk with deficiency of non-fatty solids—Analyst's Certificate—No direct evidence produced of Adulteration.*

A sample of milk proved, on analysis, to contain 7·28 per cent of non-fatty solids and 2·50 per cent of fat, and, on these results, the analyst's certificate stated that, when judged by the Sale of Milk Regulations, 1901, the sample showed a deficiency of non-fatty solids corresponding to an addition of 14·4 per cent of water. The analyst was not called to give evidence, nor was any other evidence produced to prove actual adulteration. The summons was dismissed on the ground that the adulteration of the milk had not been established. On appeal, it was *held*, that upon the evidence of the analyst's certificate there should have been a conviction.

Appeal allowed and case remitted.

CULLEN *v.* MCNAIR (King's Bench Division).

Sale of Food and Drugs Act, 1875, s. 3—*Cream preserved with Boric Acid—Injurious to Children and Invalids, but not to Adults.*

A pot of cream mixed with boracic acid to the extent of 21·91 grs. per lb. was sold to the Inspector, who took out a summons against the vendor under Section 3 of the Sale of Food and Drugs Act, 1875, and obtained a conviction on the ground that the presence of boracic acid in cream to the extent found was injurious to the health of children and invalids using it. The cream was sold in a pot labelled to the effect that the cream contained a small quantity of preservative to retard sourness. An appeal to Quarter Sessions resulted in the conviction being confirmed. On appeal to the High Court, it was *held*, that the conviction must be affirmed, the magistrate having found as a fact that the cream was injurious to a substantial portion of the community, viz., to children and invalids. *Appeal dismissed.*

BUNDY *v.* LEWIS (King's Bench Division).

Sale of Food and Drugs Act, 1875, ss. 6, 8—*Paregoric demanded—Substitute supplied—Sale to the prejudice of the Purchaser.*

Paregoric was asked for, and the substance supplied contained only half the amount of alcohol which should be present in a genuine sample of paregoric, and contained no tincture of opium, which is an essential

constituent of paregoric, according to the British Pharmacopœia. The bottle was labelled "Paregoric—substitute," and the vendor was an unqualified assistant. The Magistrates refused to convict, on the ground that it was not paregoric that had been sold, because the vendor, being an unqualified assistant, could not sell poisons without committing an offence against the Pharmacy Acts. On appeal, it was *held*, that there was no sale to the prejudice of the purchaser under the facts as proved. *Appeal dismissed.*

FOOT *v.* FINDLAY (King's Bench Division).

Sale of Food and Drugs Act, 1899, s. 1 (5)—*Butter and Margarine Act*, 1907, s. 5 (1) (f)—*Importation of Margarine with excess of Water—Form of Certificate.*

It was *held* (on appeal) that it was not necessary for the certificate of the Government Analyst, required under Section 1 of the 1899 Sale of Food and Drugs Act, to be in the form prescribed in the Schedule of the 1875 Act, and that the case should be remitted to the Magistrates. *Appeal allowed.*

HARGREAVES *v.* SPACKMAN (King's Bench Division).

Sale of Food and Drugs Act, 1875, ss. 9, 25—*A Warranty to be in writing.*

A milkman entered into a written agreement with a Dairy Company for a supply of genuine milk for a period of one year, the agreement stating "that no warranty is hereby implied and that the buyer must satisfy himself of the quality of the milk before it is accepted by him." It was verbally agreed that the milk should be obtained from a farmer direct by the milkman, and such milk was, in fact, sent to the milkman's station, addressed to the Dairy Company, and warranted, on the labels attached to the churns, as pure new milk with all its cream and free from preservatives. The sample taken by the Inspector was taken from a churn at the station, and proved, on analysis, to be deficient in milk-fat to the extent of 23 per cent. The Magistrate dismissed the summons on the ground that the warranty was proved to his satisfaction, and that the milkman sold the milk as delivered to him under warranty from the farmer. On appeal, it was *held*, that the Magistrate's decision was wrong, the warranty being between the farmer and the Dairy Company, and not between the farmer and the milkman. *Appeal allowed.*

REES *v.* DAVIS (King's Bench Division.)

Sale of Food and Drugs Act, 1875, s. 25—*Adulterated Milk—Warranty defence.*

A sample of milk proved, on analysis, to be adulterated with added water to the extent of 13·7 per cent. A warranty was produced consisting of a contract by which the vendor agreed to supply to the milkman the milk supplied to the vendor by a farmer in the same condition as received and as warranted by him. The supply of milk, from which the sample was taken by the Inspector, was received by the milkman as agent for the vendor, at the railway station, although the supply

itself was consigned from the farmer to the vendor and labelled accordingly, with the words "warranted pure new and unskimmed milk." It was contended that the contract and label contained a warranty under Section 25 of the Sale of Food and Drugs Act, 1875, but the Magistrate did not agree with this contention, and a conviction followed. On appeal, it was *held*, that the warranty between the farmer and the vendor held good between the vendor and the milkman, the label constituting a sufficient connection between the particular consignment and the warranty. *Appeal allowed and conviction quashed.*

TYLER *v.* DAIRY SUPPLY COMPANY, LIMITED (Appeal Court).

Sale of Food and Drugs Acts Amendment Act, 1879, s. 3—Sample of Milk procured by Assistant Inspector and Legal Proceedings taken by Inspector.

An assistant Inspector, by direction of an Inspector, took a sample of milk, which, on analysis, proved to be deficient in milk fat to the extent of about 9 per cent. The sample was submitted to the Analyst by the Inspector, who did not himself take the sample, and proceedings were instituted and carried on by, and in the name of, the Inspector. The Magistrates refused to convict on the ground that the proceedings ought to have been taken by the assistant Inspector who, himself, took the sample, but, on appeal, it was *held*, that the decision of the Magistrates was wrong. *Appeal allowed and case remitted.*

WILKINSON *v.* ALTON (King's Bench Division).

Margarine Act, 1887, s. 3—Definition of Margarine—New substance known as "Nut Cream Butter," but containing no Animal Fat.

An article known as "Nut-Cream Butter" was sold to an Inspector at 10d. per lb., and was stated to contain no animal fat whatsoever, but to be a compound unknown at the passing of the Margarine Act, and to be a compound that could not, therefore, be included in the term "Margarine." The Magistrate refused to convict, being of opinion that the compound known as "nut-cream butter" was prepared in imitation of butter, but did not come within the purview of the 1887 Margarine Act, because it contains no animal fat and was unknown when the Margarine Act was passed. On appeal, it was *held*, that the Magistrate's decision was wrong, the definition of margarine in Section 3 of the Margarine Act, 1887, including any substance prepared in imitation of butter, although it contains no animal fat and was unknown when that Act was passed.

Appeal allowed and case remitted.

AUDITOR'S SURCHARGE.

REX *v.* CARSON ROBERTS (Appeal Court).

Public Health Act, 1875, s. 247 (7) (8)—Poor Law Amendment Act, 1844, s. 35—Auditor—Right to Surcharge without appeal to High Court—Certiorari to quash.

The Public Official Auditor of the Local Government Board surcharged certain members of the Highways Committee and officials of

the Westminster City Council, and these surcharges were quashed by the Divisional Court, it being held that the Court has power to review the auditor's decision, not only if it is erroneous in point of law, but also if it is wrong upon the merits. On appeal, it was *held*, that the powers and duties of an auditor are strictly confined to auditing, and that the words "person accounting" in Subsection 7 of Section 247 of the Public Health Act, 1875, mean the person who brings in accounts for audit, i.e., in the case of the Westminster City Council, the Council itself; and, further, that the auditor has no power to enquire into the negligence of the individual members of the Council or of its officials. *Appeal dismissed.*

COMBINED DRAINAGE.

Bromley Borough Council *v.* Cheshire (King's Bench Division).

Public Health Act, 1875, s. 41—*Public Health Acts Amendment Act*, 1890, s. 19—*Single private Drain—Nuisance—Liability of neighbouring Owner.*

A single private drain (combined) under Section 19 of the Public Health Acts Amendment Act, 1890, was defective, requiring amendment and repair, and the Sanitary Authority served notices in the usual way upon the two owners concerned, but carried out the necessary works themselves, the owners being in default. No twenty-four hours' written notice had been given to one of the occupiers of the intention of the Sanitary Authority to enter upon the premises and cause an examination and inspection of the drainage of the house; and it was, further, admitted that there was no emergency case proved. The Magistrates held that there had been irregularity of legal procedure by the Borough Council, and that, consequently, they were unable to make an order for the apportionment of the expenses of the work upon the owners concerned. On appeal to the King's Bench Division it was *held*, that the decision of the Magistrates was wrong, and that the giving of the notice to the occupier was not a condition precedent to recovering the expenses from the owners. *Appeal allowed.*

Wilson's Music and General Printing Company *v.* Finsbury Borough Council (King's Bench Division).

Public Health (London) Act, 1891, ss. 3 and 4—*Metropolis Local Management Act*, 1855, s. 250—*Drain or Sewer—Nuisance—Service of Intimation Notice only—Work done by Owner under protest—Right to recover Expenses from Sanitary Authority.*

Several houses are drained by a combined operation, taking also the drainage of certain other public buildings. Nuisance is discovered, and an intimation notice (but not a Statutory notice) served by the Sanitary Authority upon each of the occupiers concerned. The work was done under protest by the owners concerned, and a claim afterwards made upon the Sanitary Authority who maintained that, as only an intimation notice had been served, the work was not done under compulsion, but voluntarily. It was *held*, that, although the service of an intimation notice under the Public Health (London) Act, 1891,

does not by itself amount to compulsion, any work done as the result of such a notice is done under compulsion and not voluntarily, and that, consequently, the expenses can be recovered from the Sanitary Authority concerned, which was liable, in addition, for the work—the combined drain being a "sewer." *Judgment for the Plaintiffs.*

DRAINAGE.

FARMER *v.* LONG (King's Bench Division).

Public Health (London) Act, 1891, ss. 2, 4 and 40—*Metropolis Management Act*, 1855, ss. 82, 85—*Anonymous Postcard complaint—No result from the Drain Test—Leaky as against leaking Drain—Nuisance under Public Health Act.*

An anonymous postcard was received by a Sanitary Authority, drawing attention to an alleged nuisance at a certain house, and the Inspector, on visiting, failed to find any evidence of a nuisance. A notice was served under Section 82 of the Metropolis Local Management Act, 1855, and Section 40 of the Public Health (London) Act, 1891, upon the occupier, and the Sanitary Authority, through its officers, opened up the drain, which was found to be clay-jointed, the clay having entirely perished. Notices were served upon the owner to abate the nuisance. The Magistrate made an order, which was appealed against. It was *held*, that, if it was discovered that there was, in fact, a nuisance, it does not signify how such nuisance was discovered, whether by proper or improper means; and, further, that the Magistrate found that the clay-jointed drain was proved to be leaking (and not only leaky) and, therefore, a nuisance within Section 2 of the Public Health (London) Act, 1891. *Appeal dismissed.*

OATH ADMINISTRATION.

RABEY *v.* BIRCH (King's Bench Division).

Oaths Act, 1838—*Witness desiring to be sworn on his own Testament.*

This was an appeal to the High Court against the decision of a County Court Judge, who refused to allow a medical man, as a witness, to be sworn on a book which the witness produced, and which he stated was a Testament. The County Court Judge held that, if the medical man preferred not to kiss the Court's Testament, his only alternative was to be sworn in the Scotch fashion, i.e., by uplifted right hand. The High Court *held*, that the decision of the County Court Judge was correct, and that this decision could be enforced by the existing powers as to contempt of Court, there being no evidence that the Testament produced was, in fact, a Testament.

Appeal dismissed.

REMOVAL OF REFUSE.

WESTMINSTER CITY COUNCIL *v.* GORDON HOTELS LIMITED (House of Lords).

Public Health (London) Act, 1891, s. 33—*Removal of Refuse—Trade Refuse—Decision of Magistrate final.*

The Divisional Court held that, where a dispute arises as to what is

trade refuse, and the matter is brought before a Magistrate for his decision under Section 33 of the Public Health (London) Act, 1891, the decision of the Magistrate is final. The Court of Appeal upheld the decision of the Divisional Court. The House of Lords affirmed the decision of the Appeal Court. *Appeal dismissed.*

RIVER POLLUTION.

Brook Limited *v.* Meltham Urban District Council (Appeal Court).

Rivers Pollution Prevention Act, 1876, s. 7—Bacterial Filter Beds not "Sewers."

The County Court Judge decided that bacterial filter beds formed part of the "Sewers" of a Sanitary Authority, and could be taken into account in deciding as to whether or not the "sewers" were sufficient for the requirements of a district under Section 7 of the Rivers Pollution Prevention Act, 1876. This decision was reversed by the Divisional Court, it being held that the word "sewers" means sewers proper, the actual pipes, and not the sewerage system of the district, and that bacterial filter beds are not "sewers" within the meaning of the Section. This decision of the Divisional Court was reversed by the Court of appeal, and the judgment of the County Court Judge restored. *Appeal allowed.*

Attorney-General *v.* Birmingham, Tame, and Rea District Drainage Board (Chancery Division).

Public Health Act, 1875, s. 17—Pollution of Stream by Sewage Works.

The Birmingham, Tame, and Rea District Drainage Board discharged sewage or filthy water from their sewage farm into the river Tame, without having previously freed such water from all excrementitious or other foul or noxious matters such as would affect deleteriously the purity of the water of the river, thereby contravening Section 17 of the Public Health Act, 1875. It was admitted that the River Tame was polluted nearer its source than the points at which the Birmingham, Tame, and Rea District Drainage Board discharged their effluents, but it was claimed that the River Tame was purer below these points than above them.

Held, that the purity of a River must be considered, not as a whole, but at the actual point or points of discharge of an effluent or effluents from a sewage farm. *Injunction granted.*

Owen *v.* Faversham Corporation.

Public Health—Discharge of untreated Sewage into Tidal Waters polluting Oyster Layings and causing a Nuisance—A Common-Law or prescriptive right.

Untreated sewage was discharged by the Faversham Corporation into tidal waters so as to pollute certain oyster fisheries, and an action was taken for an injunction to restrain and for damages. The Faver-

sham Corporation claimed that they had a common-law or prescriptive right to discharge sewage into the sea.

Held, that the Corporation had neither a common-law right nor a prescriptive right to discharge sewage into the sea so as to cause a nuisance, and that an injunction must be granted, together with an nquiry as to damages. *Injunction granted.*

West Riding of Yorkshire Rivers Board *v.* Butterworth and Roberts (Appeal Court).

Rivers Pollution Prevention Act, 1876, ss. 3, 4, 7, 10—*Manufacturing Refuse sent into Stream through a Sewer—Liability of Manufacturer.*

This was an Appeal from the decision of the High Court, which held that a person, sending polluting liquid from a manufactory through a sewer into a stream, commits an offence under Section 4 of the Rivers Pollution Prevention Act, 1876, whether or not the Sanitary Authority, owning the sewer, has afforded such person facilities for so draining his manufactory into the sewer. The Appeal Court affirmed the decision of the High Court. *Appeal dismissed.*

WATER SUPPLY.

Frederick *v.* Bognor Water Company (Chancery Division).

Bognor Water Act, 1891, s. 61—*Supply of Water to a Boarding School —Domestic supply.*

The Bognor Water Company claimed that the business of a boarding school, carried on in a dwelling-house, was a business for which water was required under special rates mentioned in the Company's Act, and not a domestic supply. The Court *held*, that the business of a boarding school, carried on in a dwelling-house, which only involved the user of water for domestic purposes, was not a business for which water is required within the Company's Act, and that water must be supplied at the rates fixed for domestic purposes. *Judgment for Plaintiff.*

THE EDITOR'S TABLE.

In this section we endeavour to bring before our readers the work that is being done by inventors, and the manufacturers on their behalf. May we emphasize our desire that samples, together with descriptions and small illustrations (if necessary), should reach us by NOVEMBER. We experience some difficulty in obtaining compliance with this necessary condition, and trust that our friends will recognize its importance.

In respect to Pharmaceutical Products and Dietetic Articles, we are always ready when a sufficient quantity is sent to us *early in the year*, to arrange for it to be tested in Hospital practice and reported upon; under other circumstances our knowledge is necessarily more limited: but frequently the simple information as to where a particular preparation can be obtained is all the practitioner requires. We are anxious to express no opinion except as a result of practical knowledge, and it is owing to this fact that a notice in the *Medical Annual* has come to be valued. If we departed from the principles which have guided us since the first volume of the *Annual* was published, we should forfeit a position which enables us to be of some use both to the practitioner and the manufacturer.

MEDICAL AND SURGICAL APPLIANCES.

Abdominal Belt (Men's).—Cases of enteroptosis are far less common in men than women; but such cases occur more frequently than is supposed, and the cause of the trouble goes unrecognized. For the treatment of this condition the "Domen" men's abdominal belt (*Fig.* 112), is immediate in its results, and it would be difficult to devise a better means of support. In cases of obesity, or after abdominal operation, these belts are extremely useful. They are made of pure wool of a lasting and natural shade, and are more porous than the material usually employed in such appliances. They are constructed on the same principles as the female belt, but are designed to fit the male figure. The "Domen" Belts Co., Ltd., 456, Strand, W.C., or any of the Jaeger Co.'s Depôts, can supply them.

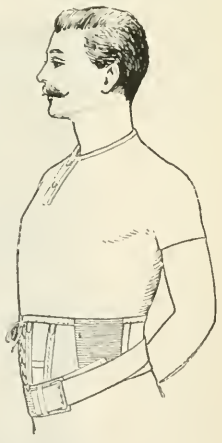

Fig. 112.

Arch Sock.—The improved "Alfradine" arch sock (*Fig.* 113) is extremely light, the metal being

Fig. 113.

aluminium. As the leather portion is one piece, it may be trimmed to suit any shape of foot. It is excellent for the treatment of flat-foot. When ordering it is necessary to state the size of boot worn by the patient, and whether for man or woman. Messrs. R. Sumner & Co. supply these at 4s. 6d. the pair.

Ambulance Outfit.—Messrs. Ferris & Co., of Bristol, have introduced a neat ambulance outfit, suitable for motorists and others, containing a variety

Fig. 114.

of articles suitable for first aid. The whole is packed in a tin case, 6½ by 4 by 2 inches (*Fig.* 114).

They have also produced a "First-Aid Cupboard" (*Fig.* 115), which contains a large number of articles necessary for first aid, in quantities suitable

Fig. 115.

for factories, public offices, schools, or police stations. It is 19 by 18½ by 8 inches, and will prove a most valuable acquisition wherever it is used. The cost is only £1 11s. 6d.

Artery Forceps.—Mr. Swinford Edwards has modified Greig Smith's forceps by having them serrated like Spencer Wells' forceps instead of being hollowed out (*Fig.* 116). They have thus the good points of both forceps, and are free from the objection which some have urged against the hollow blade. They are made by the Holborn Surgical Instrument Co., and cost 3/–.

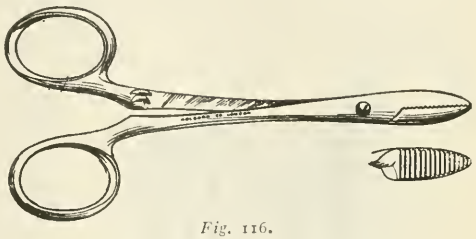

Fig. 116.

Aural Speculum (Sir Wm. Gowers').—So far no great success has attended the introduction of a convex lens in association with the aural speculum, but in the instrument invented by Sir Wm. Gowers the practical difficulties are overcome. The speculum (*Fig.* 117) is very little larger than those in ordinary use, and a convex lens is introduced within it in such a manner as to be immediately removable for purposes of cleansing. After carefully testing it in a number of cases, we are assured of its great practical value, and that it will largely facilitate the work of aural diagnosis. We must congratulate both Sir Wm. Gowers and Mr. Hawksley, of 357, Oxford Street, W., on this valuable appliance.

Fig. 117.

Bier Treatment, Apparatus for.—Prof. Bier's method of inducing artificial hyperæmia in the treatment of inflammatory diseases, which was described fully in our last issue, has caused a large demand for vacuum apparati. These consist chiefly of various shapes of glass bell vessels, either fitted with an india-rubber ball for inducing a vacuum, or which can be attached to a pump for exhausting the air. A circular containing illustrations and prices of these appliances can be obtained from Messrs. R. Sumner & Co., of Liverpool, who are also agents for Bier's hot-air chambers for the local application of hot air. We hardly consider the latter an improvement upon appliances which have long been used in this country, but rather a reversion to an earlier method employed before electricity gave us a more effective means of applying local heat.

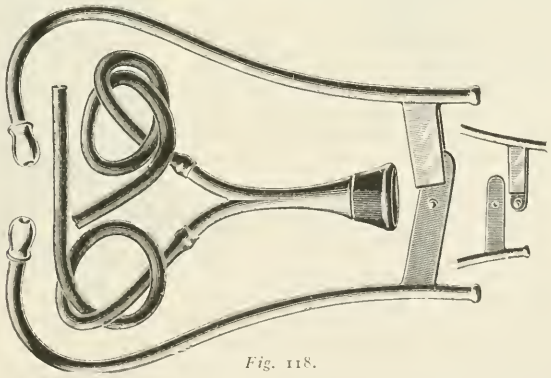

Fig. 118.

Binaural Stethoscope.—Messrs. Ferris & Co. have issued a metal dome top chest-piece for a binaural stethoscope, which is much more resonant than those usually sold. They have also a new binaural instrument (*Fig.* 118)

with a spring-clamp to prevent pressure upon the ears. It occurs to us that if all the metal parts of a binaural stethoscope except the chest-piece were removed, there would be no pressure upon the ears nor need of a spring-clamp. The india-rubber tubes are alone sufficient.

Centrifuge (Water-Motor).—The centrifuge shown in our illustration (*Fig.* 119) can be worked from any ordinary water-tap, so that neither labour nor cost is involved when using it. It is very strongly made, and there is nothing to get out of order. It has a four-arm aluminium gallery, with two graduated and two ungraduated tubes in aluminium tube-holders. It can not only be used to separate urinary deposits, but also to estimate the amount of fat in milk, and the red corpuscles in the blood; for this purpose it is furnished with a hæmatocrit, which enables an estimate to be very rapidly made. This is the most perfect centrifuge we have seen, and is exceedingly cheap, only costing 35s. complete. It would save its cost in a very short time as compared with a centrifuge driven by hand or by an electric motor. Messrs. R. Sumner and Co., of Liverpool, produce this appliance.

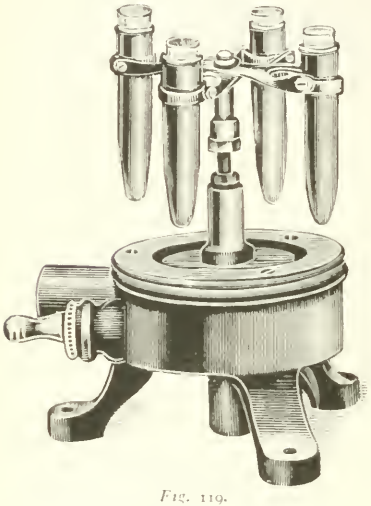

Fig. 119.

Chloride of Ammonium Inhaler (The Kloram).—Mr. Frank A. Rogers has introduced an appliance for producing chloride of ammonium for inhalation (*Fig.* 120), which is a decided improvement upon those formerly in use. The whole thing is practical and simple, and the vapour produced is the neutral chloride, which is wholly unirritating. There appears to be a revival in the use of chloride of ammonium inhalations by specialists, and this instrument meets the requirements perfectly. Even at a little addition to the cost we think it would be better sent out in a wooden instead of a cardboard case. The present price, with everything complete for immediate use, is 7/6.

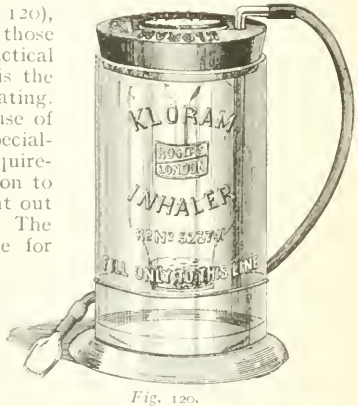

Fig. 120.

Clinical Thermometer Case, with Clip.—Most of us carry our clinical thermometers in the watch pocket, and they sometimes fall out and break. Messrs. R. Sumner & Co. have introduced a case furnished with a clip, which keeps it secure and prevents it shaking about. These cost 1s. 6d., and are eminently practical.

Chloroform Bottle.—The "Metaline" chloroform drop bottle with Symon's stopper and cap consists of a stout outer metal case, nickel-plated, in which a strong amber-coloured bottle is fixed. The union between the neck of the bottle and the case is effected by means of metal cement. The bottle

is graduated in drachms, to 16, and a window is provided in the metal case (*Fig.* 121) so that the chloroform can be easily seen. This forms a very safe method of carrying chloroform in the surgeon's bag, and for its administration, leakage or evaporation being efficiently prevented. The bottle, which has quite a handsome appearance, costs only 7s. 6d. Supplied by Messrs. R. Sumner & Co., of Liverpool.

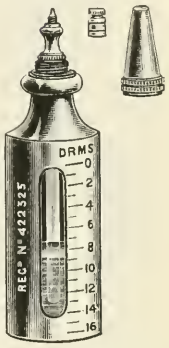

Fig. 121.

Consulting-room Couches. — Messrs. Ferris & Co., Bristol, send us particulars of a cheap and efficient consulting-room couch. The Medical Supply Association, 228–230, Gray's Inn Road, W.C., make a speciality of a couch which is adapted for the Trendelenburg or horizontal position, and which when not in use can be folded up against the wall. We have not the space to illustrate either of these couches, but the makers will supply full particulars.

Cotton Wool Holder —Dr. Hemington Pegler, senior surgeon, Metropolitan Ear, Nose, and Throat Hospital, has designed a cotton wool holder, which we illustrate in *Fig.* 122. It shows a removable dome-shaped cover of bright metal, which encloses the wool by catching on to a flat heavy base of the same material. On one side of the cover are three fenestrations, through which the requisite pledget of wool can be detached by forceps, the weight of the receptacle keeping it quite firm. To protect the wool when not in use, a movable valve-like metal plate, operated by a small button and adjustable by means of a screw at the summit, slides over the apertures; it also serves to alter their shape and dimensions when required. The holder is best charged through the fenestrations, longish masses about the width of three fingers being selected from a sheet of "long fibre" wool. For hospital use, a larger size can be had, and the shape of the apertures is not stereotyped, but can be ordered in the form of parallel slits, inverted triangles, two triangles base to base separated by a cross bar, or better still, all of these in the same cover. The whole contrivance is sterilizable. It is made by the Holborn Surgical Instrument Co.

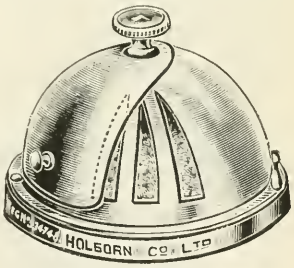

Fig. 122.

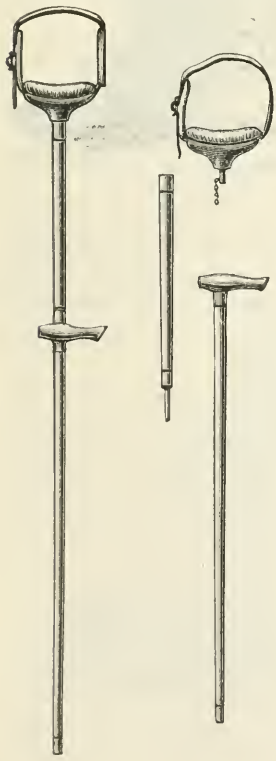
Fig. 123.

Crutch (the Patent "Invisible").—(*Fig.* 123.) —Only the walking-stick is visible when this crutch is in use. The upper part is worn under the coat and attached to the shoulder. Owing to this attachment, the crutch moves with the patient, instead of being taken up and lifted at

each step, as with the ordinary crutch. The padding is pneumatic, and to this as well as its great lightness, the comfort in use is due. When the wearer is paying a visit and wishes to sit down, the walking stick is instantly detached, while the upper part remains invisible. When at home the crutch can be detached from the axilla, and then the strap and pneumatic pad which remain attached to the shoulder weigh only a few ounces. It was designed by Dr. Percy Wilde, of Bath, to meet the case of patients who would use a walking-stick but not a crutch, because the latter was so unsightly and cumbersome; but as every crutch-user who has seen this crutch insists upon having one, they are now being manufactured for general sale by Mr. W. H. Smith, High Street, Bath, who will supply them through any surgical instrument maker.

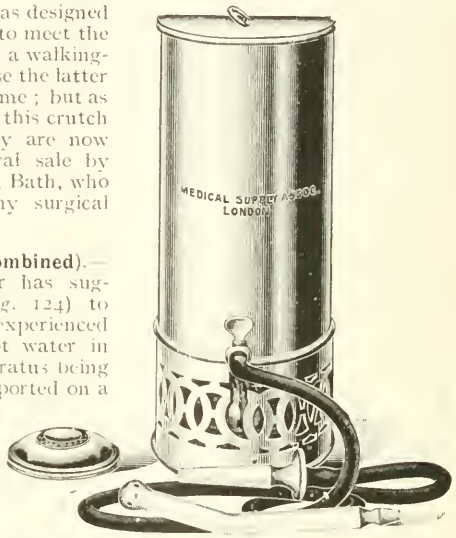

Fig. 124.

Douche and Sterilizer (Combined).—Mr. Claude St. Aubyn-Farrer has suggested this arrangement (*Fig. 124*) to meet the difficulty so often experienced by midwives in obtaining hot water in cases of emergency. The apparatus being provided with a lamp and supported on a firm stand, the midwife will always have the means of warming water, so that a hot douche can be obtained in a few minutes. Again, in case the surgeon's aid is called in, she can provide him with a sterilizer for his instruments, as it is large enough to hold forceps, etc. Without the stand and lamp it forms an ordinary douche can. It is of a convenient size, and will easily go in the midwife's bag. It is made by the Medical Supply Association, 228–230, Gray's Inn Road, W.C., and the price, complete with fittings, as illustrated, is 10/6.

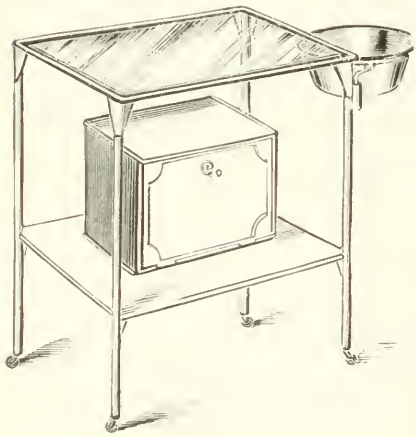
Fig. 125.

Dressing, Grease-proof.—This is practically a soft lint with a flexible oil-proof paper as a backing. It is a most convenient and efficient method of applying ointments, oils, and liniments to the skin, and is economical. We have decided to adopt it in our own hospital practice. It is made in sheets, and also in 3-yard rolls, 8 inches wide, by Messrs. Ferris & Co., Bristol.

Dressing-Table.—We illustrate here (*Fig. 125*) a metal table with glass top, which has been designed for the surgery or consulting-room. It has a shelf beneath with lock-up box for dressings, etc., and a container for antiseptic solution at the side. The table measures 22 by 17 ins., and costs £2 15s. Messrs. R. Sumner & Co. are the manufacturers.

Ear and Nasal Syringe.—This is an all-rubber syringe, with a groove cut in either side of the nozzle (*Fig.* 126) which admits of a back flow of the stream and relieves undue pressure upon the tympanum. They are quite the best thing for patient's use. Manufactured by Messrs. R. Sumner & Co., of Liverpool, from the design of Dr. Hayward. Price 1s. 6d.

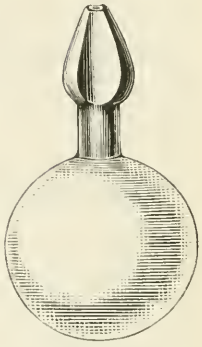

Fig. 126.

Evacuating Apparatus, Modified.—The illustration (*Fig.* 127) shows an instrument which has been made by Messrs. Down Bros., Ltd., London, at the suggestion of Dr. Arthur Lankester, of Peshawar, who having a considerable number of cases of stone in the bladder to deal with, felt at last compelled to devise an instrument especially adapted for use with young children. The two essential points in this modified evacuator are (1) its size, the bulb containing little more than half the contents of that of the adult pattern of the same model, and (2) the greater softness and compressibility of the bulb.

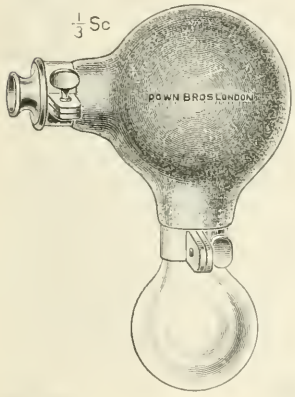

Fig. 127.

Eye-dropping Pipette.—Messrs. Ferris & Co. have introduced a neat little pipette in a wooden case at the cost of sixpence. It is aseptic and practical.

Eye Instruments in Metal Sterilizer.—This illustration (*Fig.* 128) shows a case of eye-instruments intended for minor operations, in which the outer case is convertible into a sterilizer; a plan adopted by the manufacturers, Messrs. R. Sumner & Co., Ltd., in their minor operating case, which has been greatly appreciated by the profession. The following instruments are contained in the case: iridectomy knife, Weber's canaliculus knife, Graefe's cataract knife, iris forceps, iris scissors

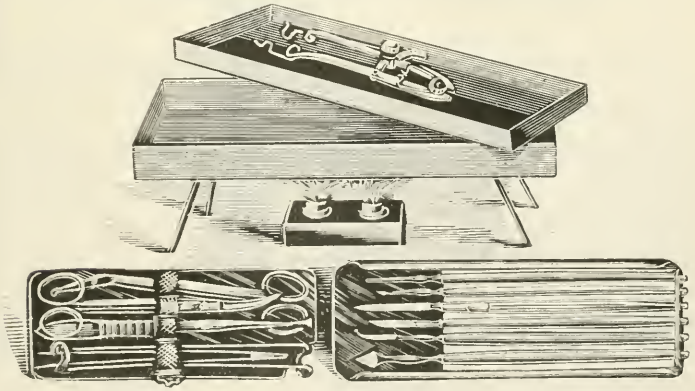

Fig. 128.

(curved on flat), Clarke's speculum, scalpel, Bier's cataract needle, gouge, Pellier's retractor, fixation forceps with catch, iris scissors (elbow), all fitting

together with stand and lamp into an outer chamois bag. The whole thing is neat and compact, and we have no doubt it will be as popular as the operating case. Price £2 2s.

Gag (Doyen's), with Ackland's Jaws.—By means of this modification the tooth plates can be more easily introduced than with the ordinary pattern. This will be readily understood from the illustration (*Fig.* 129). It is manufactured by the Medical Supply Association, 228–230, Gray's Inn Road, W.C.

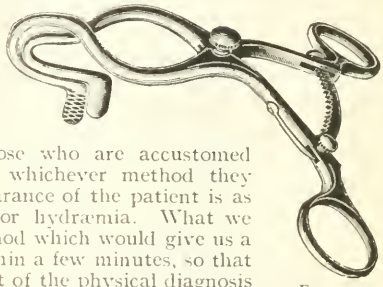

Fig. 129.

Hæmoglobinometer (Rotary).—Those who are accustomed to test the blood for hæmoglobin, whichever method they adopt, know how unreliable the appearance of the patient is as a guide to the diagnosis of anæmia or hydræmia. What we have long wanted is some simple method which would give us a true idea of the state of the blood within a few minutes, so that the test should become as much a part of the physical diagnosis as feeling the pulse. This is now provided by the "Rotary Hæmoglobinometer" (*Fig.* 130), suggested by Dr. Arthur J. Hall, and manufactured by Mr. Hawksley, 357, Oxford Street, W. To prick the ear, take the drop on a slip of blotting-paper and slip it into a slot in the instrument, and then rotate a series of discs until the colour is matched, and read off the percentage of hæmoglobin, does not take two minutes, and the value of the information before deciding not only questions of medicine, but also of diet, is unquestionable.

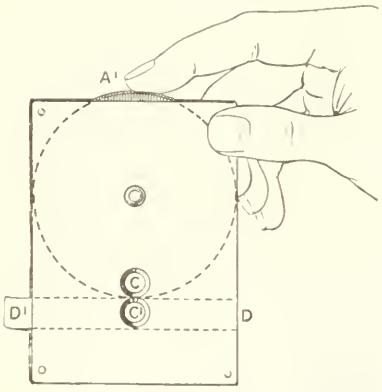

Fig. 130.

The whole appliance, with needle, slips of paper, and cotton-wool, could be contained in a visiting-card-case or carried in the flap of the pocket-book. It is because it is so practicable and so portable that we feel sure it will do more to encourage this important method of diagnosis than all the more scientifically accurate appliances, which are used too seldom because they are less convenient.

Height-measuring Standard.—Messrs. Reynolds & Branson send us particulars of this instrument (*Fig.* 131), which can be attached to the wall in the usual way, or to a personal weighing-machine. When not in use, the index can be turned down as shown in the illustration, which obviates the danger that arises from the ordinary pattern now in use. It is quite a useful appliance.

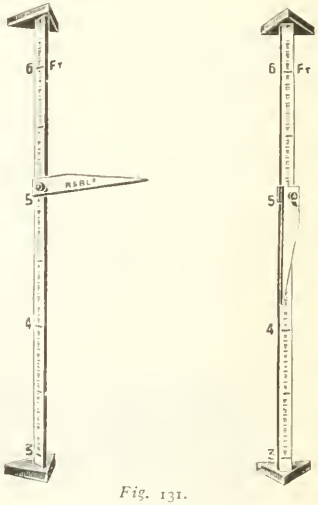

Fig. 131.

Hernia Director (Winged).—In operating for strangulated hernia, after the director has been inserted beneath the stricture, the distended intestine sometimes curls over the edge and gets in the way when the stricture is about to be divided. To keep it back requires a little care, but this inconvenience can be entirely remedied by the modification of the instrument commonly in use, which is shown in the illustration (*Fig.* 132), and has been made by Messrs. Down Bros., Ltd., for Mr. C. P. Childe, F.R.C.S. From the sides of

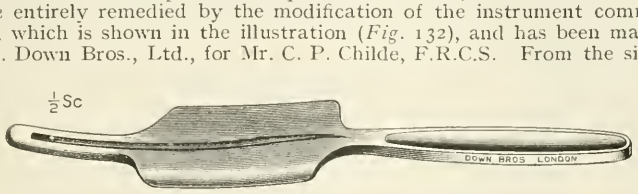

Fig. 132.

the director (which otherwise is identical with that ordinarily in use), and one inch from its end, two wings project. When it is in position, the front edges of the wings are close up against the face of the stricture, the wings projecting on either side keep everything out of the way, and the stricture can be very easily divided. Though devised to remedy a somewhat minor difficulty, it accomplishes this so effectually that it has been submitted to the notice of surgeons as an improvement on the director commonly in use.

Hypodermic Syringe (All-glass).—Messrs. R. Sumner & Co. produce an all-glass hypodermic syringe in metal case, with two needles, for 3s. 6d. It is a perfect syringe of its kind, and appears to us very cheap.

Inhaler (Clover).—The Holborn Surgical Instrument Co. have issued a large bore Clover inhaler, with transparent mouthpiece, and fitted with every device for the successful administration of ether. It is packed in a neat case and sold at £2 5s. We can strongly recommend the inhaler.

Inhaler (Elias' Vest Pocket).—This is a single glass tube packed with wood fibre, with an inlet tube covered with a rubber band when not in use (*Fig.* 133). By its means any form of inhalant may be employed, and the

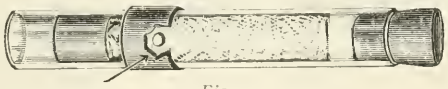

Fig. 133.

cost of the appliance is only sixpence. It is a really practical invention, and we have found much use for it. Messrs. Chas. Zimmermann & Co. are the agents.

Interrupter, Mercury Jet.—The Medical Supply Association, 228–230, Gray's Inn Road, W.C., are the manufacturers of the Greville-Gaiffe mercury jet interrupter. The amperage passed, at a recent meeting of the Röntgen Society, was up to 40 ampères at a pressure of 220 volts = 8800 watts, and this through an ordinary X-ray coil made years ago for low voltage. The result was a flame similar to that produced by a Wehnelt break. Ordinary X-ray mercury breaks pass very little above 10 ampères: hence the thinner resulting spark. The principle by which this great amperage is passed is that of multiple contacts, i.e., several jets simultaneously break contact in a gas di-electric at a number of different points, thereby correspondingly reducing the back E.M.F. at each point to the limit permitting efficient work. As either the single or the multiple contact system can be switched on as required, the interrupter can be perfectly adjusted from the feeblest currents for treatment to the greatest required for rapid radiography. In fact, this interrupter covers the whole field of X-ray and high-frequency requirements.

Its special advantages over other mercury breaks are: (1) The di-electric is gas, so that no cleaning is necessary after most prolonged work; (2) The driving speed can be adjusted from a low minimum to a high maximum number of contacts per second; (3) The break can be placed anywhere, as it in no way depends on proximity to the coil for its motive power; (4) In no period of the cycle is there any danger of a short circuit, for whenever the break stops the contact is broken; (5) The break can run independent of any current passing through the primary winding. In other words, when the break is once started the current can be switched on or off the primary circuit without starting or stopping the interrupter. (See also RADIOTHERAPEUTICS, page 78.)

Irish Linen Bandage.—We do not know when we have seen a bandage that we like better for purposes of support than one made of pure Irish linen yarn by Messrs. John Clarke & Co., Ltd., of Belfast. They are not particularly cheap—a 2½ inch bandage 3½ yards in length costs 2/—; but one of these would last for years and prove economical in the end. We can strongly recommend the bandage to our readers for the treatment of varicosis.

The same firm produce "Empire Linen Ligatures," in boxes containing twenty-four "balls." Each ball is 1½ yards long and costs sixpence. They appear to us particularly strong and practical, and many surgeons prefer them for all ordinary purposes.

Irrigator and Douche.—We illustrate here (*Fig.* 134) the best douching vessel which has come under our notice. It is all glass, and graduated. It holds four pints, and can be either suspended to the wall or stand alone. It has a metal cover, and so does not become a receptacle for dust when not in use. It is provided with four glass nozzles, viz., one each for male urethra, rectum, vagina, and wound irrigation. It has an entirely new method of starting and checking the flow of the stream by means of a sliding ring which works on a metal tube immediately behind the nozzle. This enables the tube to be held and the flow of water controlled by one hand, leaving the other free. We have long wanted to use a douche for syringing the ear, but have failed to find one capable of being operated with one hand.

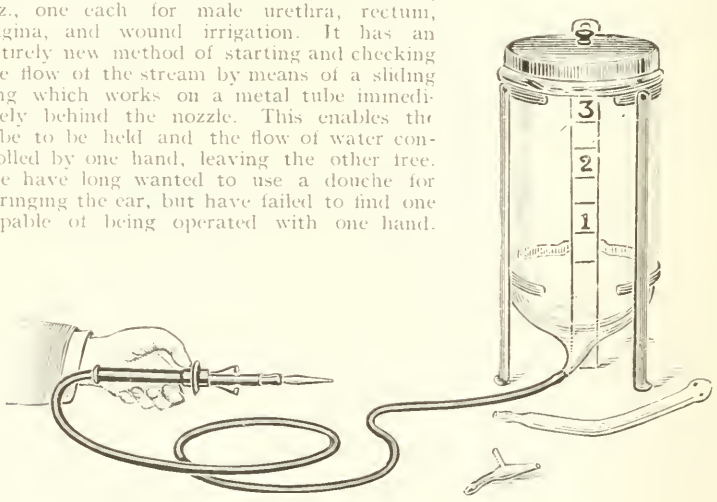

Fig. 134.

This appliance gives us what we want. This douche is also suitable for saline transfusion, and admits of absolute aseptic conditions. It only costs 5s. 6d. complete. We think the practitioner who fits one up in his consulting-room and uses it in every case where he wants a jet of water for any purpose, will thank us for the recommendation. They are supplied by Messrs. R. Sumner & Co., of Liverpool.

Jars for Antiseptic Dressings.—We illustrate here (*Fig.* 135) a new pattern of jar, made of ground glass, in sizes ranging from 5 by 3 inches to 10 by 7 inches, intended for the storage of antiseptic dressings, etc. The size 6 by 5 inches is very useful, and costs 3s. Messrs. R. Sumner & Co.

Fig. 135.

Lacrymal Retractor.—The drawing (*Fig.* 136) shows a retractor suggested by Mr. Sydney Stephenson, and made for him by Messrs. Down Bros., of 21 & 23, St. Thomas's Street, London. The instrument has four fork-shaped blades, each provided with three-pointed prongs. The blades are actuated by a screw, which is deemed a safer method than the spring adopted in other models, as there is the possibility of the instrument slipping, which might result in injury to the cornea. The blades can be brought into apposition for the purpose of introduction into the wound, and then separated to the required extent by reversing the action of the screw; and further, the blades being fitted to the arms which carry them by swivel attachments, they accommodate themselves to the shape of the wound as retraction takes place.

Ligatures.—Improved Japanese ligature silk, on wood reels containing about 100 feet, is much stronger than ordinary silk, and can be sterilized; it is made in eight sizes.

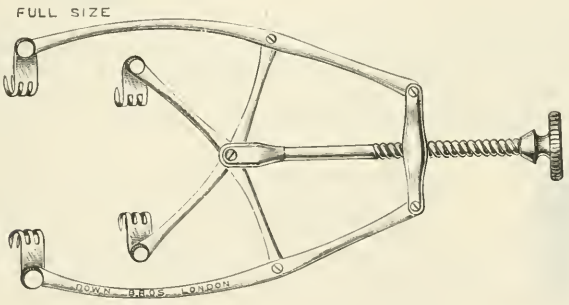

Fig. 136.

Madlener's Patent Ramie yarn is made from Ramie grass. In the process of manufacture it is sterilized in a combination of ether and alcohol, and only requires boiling before use for about fifteen minutes in a solution of 1–1000 corrosive sublimate to render it perfectly sterile. It is claimed that it is a particularly strong suture, certainly stronger than any of the ordinary ones of cotton or flax, and when used in a moist condition is much stronger than silk. It is non-absorbent, and far superior to celluloid thread. The yarn is supplied in sizes 0 to 5, in hanks of about 11 yards. The Medical Supply Association, 228–230, Gray's Inn Road, W.C.

Midwifery Forceps (Pouch for).—Messrs. R. Sumner & Co., of Liverpool, make a pouch of a washable khaki material for carrying the midwifery forceps, which is quite nice for this purpose, as it admits of antisepsis. These cost 2s. 6d., or those for the axis traction forceps 4s. 6d.

The Multostat.—We illustrate here (*Fig.* 137) a very beautiful instrument which combines all the apparatus required for the administration of electricity (except the high frequency current). Given an electric light supply (either continuous or alternating) and a multostat, the practitioner can give a galvanic current, sinusoidal (or faradic) current, or the two combined, light

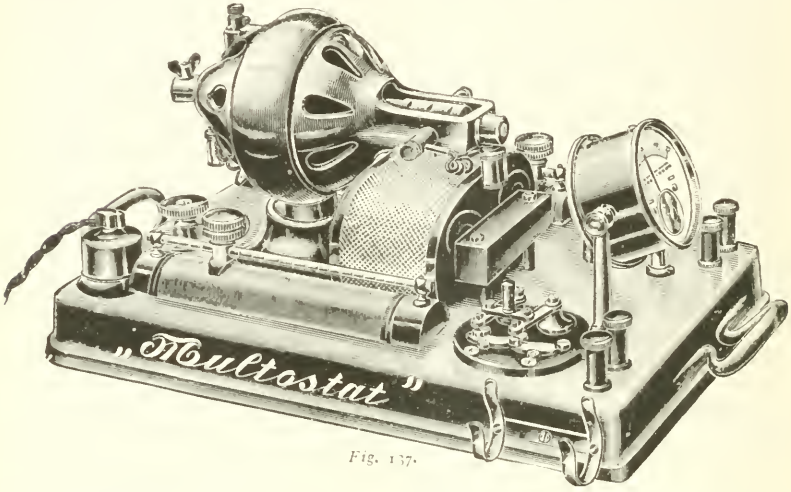

Fig. 137.

surgical lamps, or heat cauteries, drive a surgical drill, or work a vibrator for vibratory massage. There is no switchboard needed, and nothing to get out of order. The whole mechanism can be learned in a few minutes. We use one ourselves, and it has given us continuous satisfaction. They are made by the Sanitas Electrical Company, New Cavendish Street, London.

Fig. 138.

Nipple Shield.—Mr. C. Willett Cunnington has designed an improved glass nipple shield (*Fig.* 138), which distributes the pressure over a wider area, and is sufficiently large to avoid pressure upon the nipple and prevent it becoming drawn forward as the child sucks, a matter of some importance when the nipple is cracked. These are made by the Holborn Surgical Instrument Co., and are a distinct improvement on the loder form.

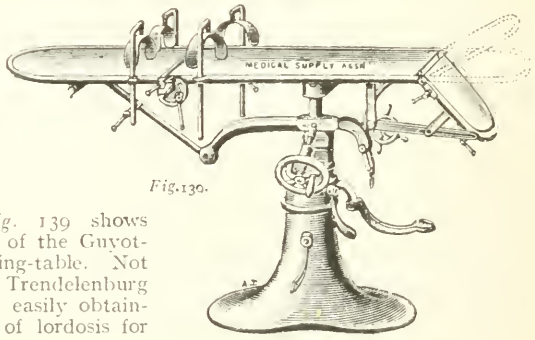

Fig. 139.

Operating-table.—*Fig.* 139 shows the latest modification of the Guyot-Greville Patent Operating-table. Not only are the ordinary Trendelenburg and perineal positions easily obtainable, but the position of lordosis for

operations on the liver, and the special positions for operations on the kidney, are obtained with equal ease. Rotation, raising, and lowering are worked by the foot pedal. The hinging device for lowering the head will commend itself to all anæsthetists. Lateral movements are secured by turning the wheel shown in the illustration. The Medical Supply Association, 228–230, Gray's Inn Road, W.C., will furnish any further particulars.

Ophthalmic Drop-bottle (Improved).—Mr. Russ Wood has made an improvement in the design of his ophthalmic drop-bottle, chiefly by broadening the

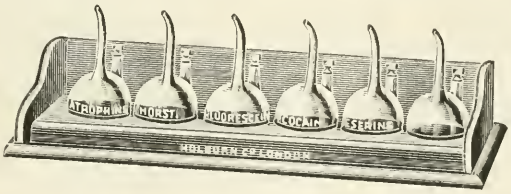

Fig. 140.

base, so that it is not easily overturned ; at the same time all the advantages of ease of sterilization are retained (*Fig.* 140). This new bottle is produced by the Holborn Surgical Instrument Co., 26, Thavies Inn, E.C.

Ophthalmic Sponges (Sterilized), "Zephyr."—Messrs. Ferris & Co. have prepared, at the suggestion of Mr. J. Herbert Fisher, M.B., F.R.C.S., a light sponge of absorbent wool, specially adapted for use in eye operations. Being sterilized at a high temperature they are ready for immediate use ; they are lightly packed, and the wool expands rapidly when in use.

Pelvimeter (The "Grevillite").—By means of this instrument (*Fig.* 141) the exact pelvic measurements are read off while the instrument is in

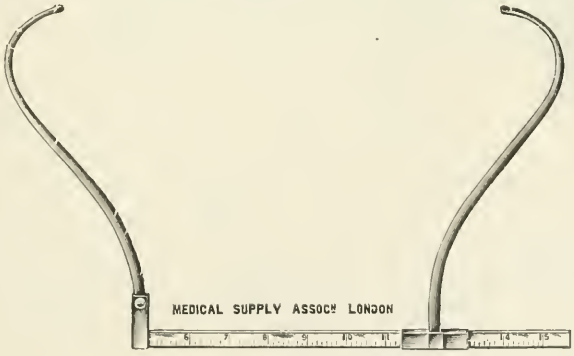

Fig. 141.

position, and without any calculations. The scale is supplied either in English measurements, or in centimetres. It folds up into a handy form. The price is 10/6. It is made by the Medical Supply Association, Ltd.

Retractor (Abdominal).—Mr. Chas. Ryall, F.R.C.S., has designed a retractor (*Fig.* 142), which is a modification of Doyen's. It is constructed of stout steel wire, and is placed at the lower angle of a median abdominal wound, and traction is made by a weight. It separates the edge of the wound and gives

an excellent view of the pelvic contents. Being made of wire it is less likely to interfere with the operator's manipulation. It also permits the bladder

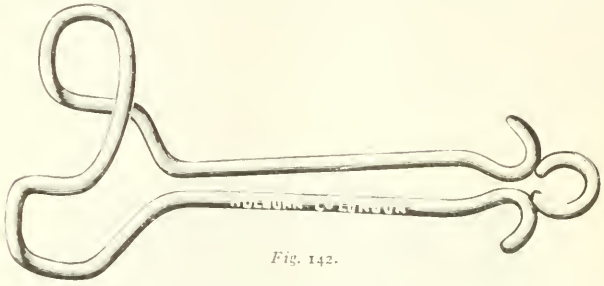

Fig. 142.

to be drawn up and fixed to the lower angle of the wound during operation. It is made by the Holborn Surgical Instrument Co.

Signalman's Vision Test.—Messrs. Reynolds & Branson, of Leeds, have made a very perfect instrument for testing the colour vision (*Fig.* 143). It consists of a plated lamp, the illuminant being a candle. A disc of various coloured glass of small diameter is alternately presented to the vision of the patient, which has the appearance of a signal lamp seen at a distance, so that both the acuteness of vision as well as the capacity for colour, are tested. On the other side of the lamp is a bulls-eye lens, which makes it quite useful for illumination, and it is possible to use it for ophthalmoscopic examination. Electrical appliances are very nice, but accumulators are always run down when required, while the candle is always ready for use. Apart from its use as a colour-testing apparatus, it is quite a useful appliance for use as an illuminant, and can be carried in the practitioner's bag.

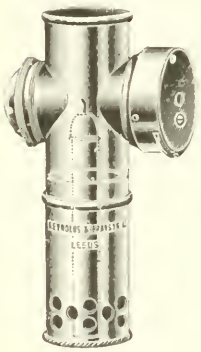

Fig. 143.

Sling-Pillow (The "Forsyth").—The sling-pillow has been devised for keeping patients in the semi-recumbent and "Fowler" positions. Propping up by pillows alone is not sufficient, as the patient slips down from his own weight. Several methods have been tried to overcome this. The above-mentioned "sling-pillow" is one of these. The patient is well propped up by means of pillows or a bed rest, the sling pillow is placed under the thighs and the side-straps are fastened to the top-bar of the bed-head. In this way the patient may be raised to any angle. It will be found very useful in the after-treatment of abdominal section cases, especially those where the operation has been in the upper abdomen. It is also useful in nursing cases of pneumonia, bronchitis, and pericarditis. The pillow, which has been devised by Mr. Cairns Forsyth, M.Sc., M.B., is made by the Medical Supply Association, 228–230, Gray's Inn Road, W.C., and the price is 8/6.

Splint for Pott's Fracture.—The apparatus (*Figs.* 144, 145) consists of a short back-splint, with the foot-piece set at an angle to the back-piece of about 30°, so that the foot is brought into a position of inversion. There is also a single side-splint of the same length as the back splint. The side-splint is provided with two rings at its lower end, which connect to two hooks below the foot-piece at its inner end. When the leg has been fixed on the back-splint, a large pad is applied to the inner side of the ankle. The side-splint is then brought up to the back-splint, and fixed with a bandage

carried round both back- and side-splints. The side-splint thus acts as a lever of the second order, the fulcrum being the hinge which fastens it to the

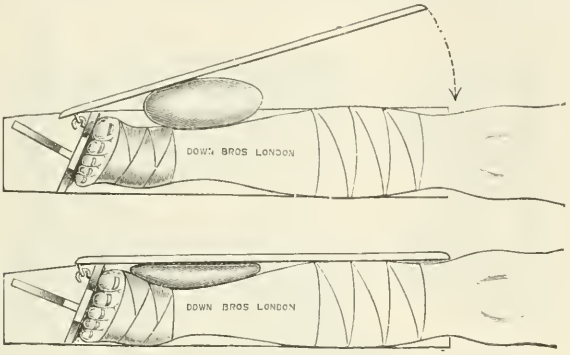

Fig. 144.

foot-piece. The lever makes pressure through the pad on the inner side of the ankle, above the inner malleolus, and forces the leg outwards, thus

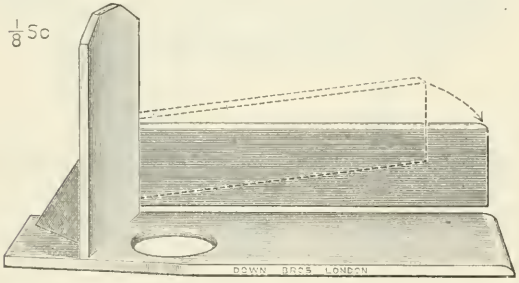

Fig. 145.

reducing the outward displacement of the foot, and the broadening of the limb above the ankle joint due to separation of the malleoli. The splints do not reach up the leg as far as the knee, so that the limb can be put up with the knee in the flexed position. The apparatus is made by Messrs. Down Bros. Ltd., from the design of Mr. G. Wilkinson, F.R.C.S.

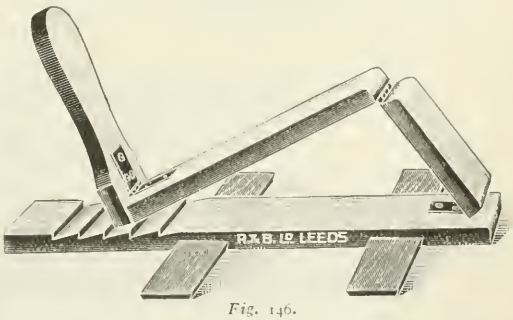

Fig. 146.

Splint (Herley's) — This is a double inclined plane splint, which allows of gradual flexion, having transverse pieces which give it a firm base. It is portable, and may be folded flat for storage (*Fig.* 146). It is manufactured by Messrs. Reynolds and Branson, Leeds.

Splints ("Universal").—Under this name Messrs. Ferris & Co. have introduced a compact and handy outfit, by means of which various patterns of temporary splints can be readily fitted up. The outfit comprises twelve

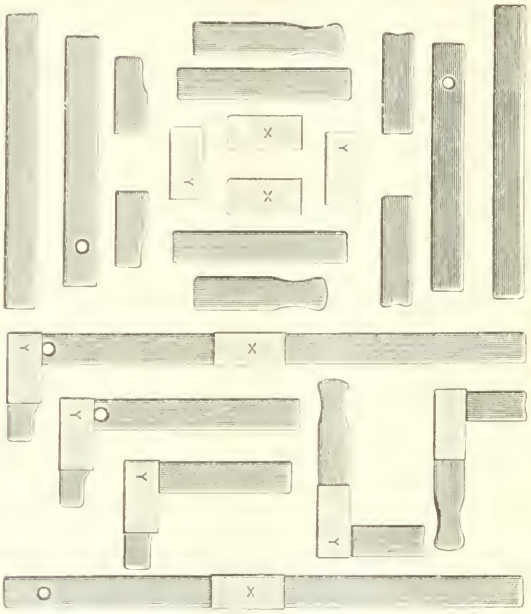

Fig. 147.

wooden splints of different sizes and shapes, and four metal connecting-pieces; by the use of the latter many useful combinations are possible, a few of which are shown in the accompanying diagram (*Fig.* 147). Price per set 15/-.

Sputum Cup.—An excellent pattern of sputum cup is sent us by Messrs. Ferris & Co. It is of blue glass with plated cover and handle in one piece, easily removable for purposes of cleansing. They cost 1/3 each.

Sterilizer and Carrier for Graefe's Knives.—The illustration shows an apparatus devised by Mr. D. M. Grieg, F.R.C.S., and made by Messrs. Down

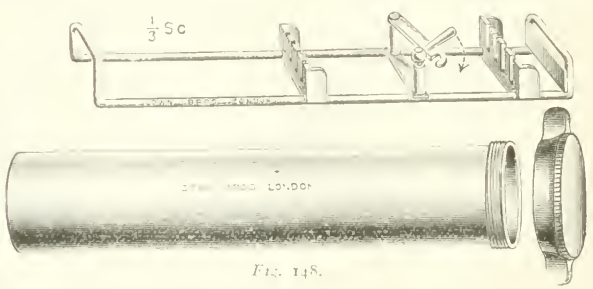

Fig. 148.

Bros., Ltd, London. It consists of a scalpel rack made to contain four knives, held firmly in position by a bar, which is fixed by a lever clamp. The scalpel rack is fitted into a metal tube, 8in. long by 1½in. in diameter,

with a screw-on lid rendering it airtight. The tube is filled with a solution of 1 part lysol to 12 of rectified spirit, which keeps the knives sterile, and it is impossible for their edges to come in contact with anything but the solution. Many surgeons maintain that the sterilization of knives is better effected by the application of some germicidal fluid, the process of boiling being liable to damage the edge.

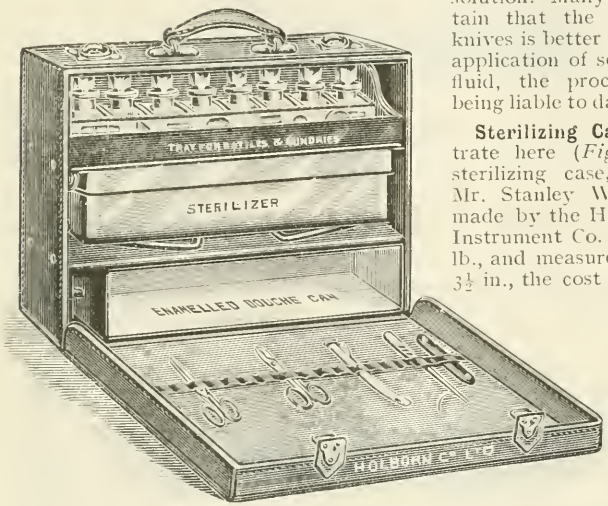

Fig. 149.

Sterilizing Case.—We illustrate here (*Fig.* 149) a new sterilizing case, designed by Mr. Stanley Woodwark, and made by the Holborn Surgical Instrument Co. It weighs 9½ lb., and measures 16 by 12 by 3½ in., the cost being £3 5s.

Surgical Coat and Sleeves.—Muslinette makes an ideal material for surgical coats and sleeves. It is light—a full-sized coat with three pockets only weighs twelve ounces—it can be washed in hot water, and the material still remains waterproof. Roll the sleeves, and the coat can be folded into a very small compass. We illustrate the sleeves (*Fig.* 150), which cost 3s. 6d. per pair. The coat costs 15s., and is distinctly the best thing we have seen for surgical use. Messrs. R. Sumner & Co. are the manufacturers.

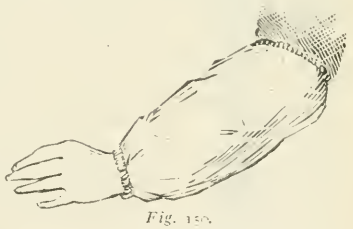

Fig. 150.

Suture Set.—The method of suturing wounds by metal clips, which is much favoured by French surgeons, is being so widely adopted in this country, that the Holborn Surgical Instrument Co. have got out a case containing forceps for holding the wound together, with carrier holding the clips, a Mitchel's suture forceps and one for removing the clips, and 100 clips, for one guinea. The whole arrangement is very neat and practical (*Fig.* 151).

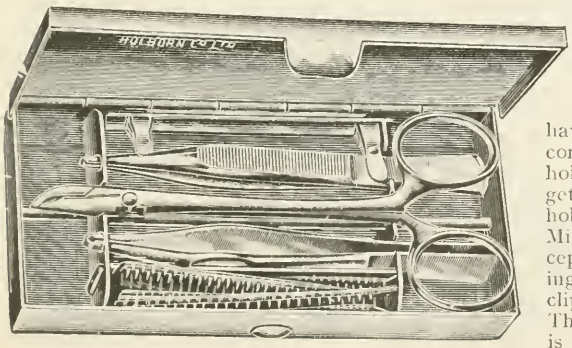

Fig. 151.

Syringe for Spinal Analgesia (Bier's).—We illustrate in *Fig.* 152 the special syringe used in the operation, with needles and cannula. The latter are the

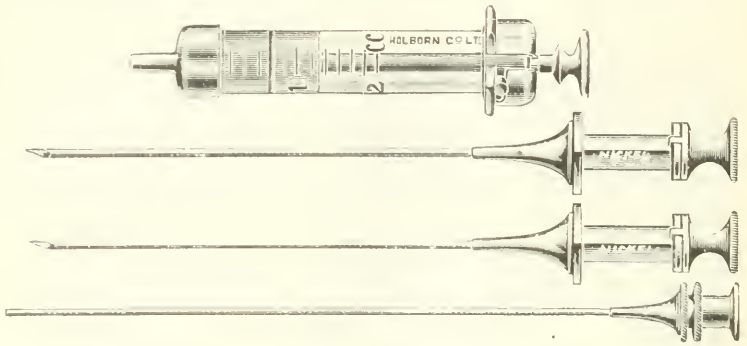

Fig. 152.

design of Mr. A. L. Barker, and are made of nickel. The whole is enclosed in a metal case, and costs 25 —. The Holborn Surgical Instrument Co.

Syringes (Hypodermic, Vaccine, and Serum).—These syringes are made of specially tough glass, and are very durable, easy to manipulate, and readily sterilized in the metal cases in which they are supplied. The syringe *per se* consists of two pieces—piston and barrel. The latter is strengthened at the nozzle, on to which the nickel-plated mount carrying the needle may be firmly fixed with a twist of the thumb and finger. The face of the barrel is engraved with a plainly visible graduated scale, while the back is of opal colour with a blue stripe which serves to indicate the position of the piston head (which moreover is of dark glass), so that the quantity injected may be easily gauged. The syringes are supplied in 20-min. capacity for hypodermic injections, 2 cc. for vaccines, and 5, 10 or 20 cc. for administering serums. They may be had with or without steel or platino-iridium needles, and with or without strong nickel-plated cases. They are made by Messrs. Parke, Davis & Co., who distinguish them by the word "Glaseptic."

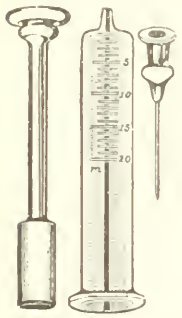

Fig. 153.

Throat Swabs (Wooden).—These are fine wooden rods, round which a piece of moistened cotton wool can be wound and used as a swab. As these wooden rods only cost eightpence a gross, they can be destroyed after use, so that absolute cleanliness is possible. Not only are these rods the ideal thing in infectious cases, but they also save us the trouble of removing the cotton wool after using iodine or other applications to the throat as one has to do with the ordinary metal probe. It saves time to be able to throw it away. Messrs. R. Summer & Co., of Liverpool, who send us these, also issue them in boxes with a neat metal handle at 2s. the box.

Toe-Post Boot (Holden).—This is not a new invention. We have used this boot in suitable cases for many years. The patient who suffers from bunion, and has the great toe everted, can be much helped by Mr. Holden's "Natureform" boot, with the post which holds the great toe in its proper position. It is not useful in very advanced cases, when the deformity is great, and should only be prescribed when the patient has the patience to bear the discomfort inseparable from the effort to coerce the toe into straight ways.

A suitable sock, or stocking, with division for the great toe, must be worn with the boot. In early cases the toe-post boot is the best curative agent we have for the cure of the condition.

We can agree with Mr. Holden in thinking that a well-fitting boot avoiding compression on the veins may exercise a very favourable influence in preventing varicose veins of the leg; but we can hardly concur in his belief that existing varicosity will be best treated by the use of a digitated stocking and a toe-post boot, and the abandonment of the usual bandages. Holden Bros., 3, Harewood Place, London, W.

Tongue Depressor (Household).—This is a simple nickel-plated tongue depressor, supplied by the Holborn Surgical Instrument Co. It is very efficient, and costs only 1/3.

Towel Forceps.—Messrs. Ferris & Co. send us a light pattern of towel forceps, made at the suggestion of Dr. B. G. A. Moynihan, of Leeds, which is well adapted for its purpose. It costs 6/6.

Trachoma Forceps, Improved.—Of the two forms of forceps for the removal of trachomatous granules or "sago grains," those of Grady, and Knapp, the

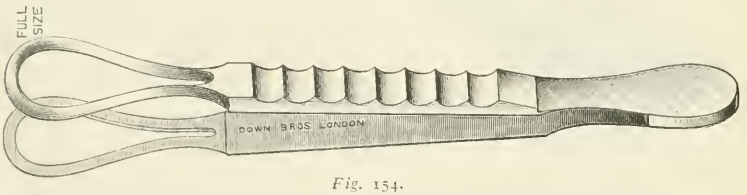

Fig. 154.

former may be considered to cause somewhat less bruising, but has the drawback, especially in unruly children, of occasionally catching in the eyelid. Messrs. Down Bros., Ltd., London, have lately made for Dr. J. Cropper, an improved pattern, with closed ends, as shown in *Fig.* 154, which gets over the difficulty with complete success.

Ureameter (Dimmock-Branson). — We have already mentioned this valuable instrument for determining the amount of urea in the urine. A modification has recently been made in the tube (*Fig.* 155), which is now graduated in percentages of urea, also in cubic centimetres, the back being enamelled to facilitate the scale readings. This improvement will add to our indebtedness to the inventors, who have done much to facilitate clinical investigation by placing so valuable an appliance at the service of the profession. Messrs. Reynolds & Branson are the manufacturers.

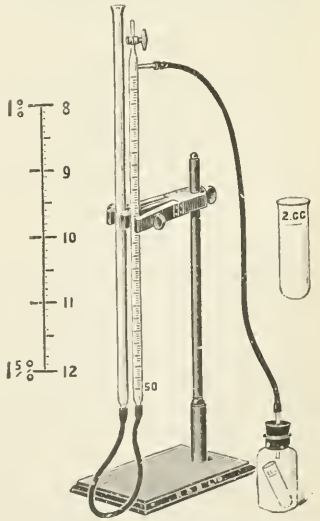

Fig. 155.

Urinometer (Pocket).—Messrs. R. Sumner and Co., of Liverpool, send us a miniature urinometer, with an easily readable index, and which is quite reliable. It is contained, with urine glass, in a neat metal case, and can easily be carried in the waistcoat pocket. It will greatly

help, not only in testing urine, but also in taking the specific gravity of the blood, because it reduces by one-fourth the size of the bottles it is necessary to carry. It will also diminish the quantity of urine needed for clinical examination. 2s. 6d.

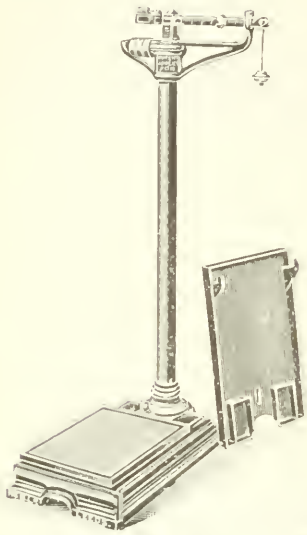

Fig. 156.

Uterine Dilator (Schroeder's).—Messrs. Ferris & Co., of Bristol, send us one of Schroeder's uterine dilators, which enable flushing to be carried out. They are made in twelve sizes, and are very efficient in use.

Weighing Machine (Personal).—The weighing machine illustrated in *Fig.* 156 is made by Messrs. Reynolds & Branson, of Leeds, and is quite the best thing we have seen for the consulting-room, and is of very small price. It is fitted with a patent protecting cover for platform, beneath which are receptacles for all loose parts. It is 4 feet high and weighs up to 24 stone.

PROGRESS OF PHARMACY, DIETETICS, &c

Albuminuria Test Tablets (Elias').—These tablets are very convenient for testing a specimen of urine for albumin, as they require no application of heat and the reaction is not affected by phosphates, urates, or bile. In the presence of albumin they give a dense white precipitate. Messrs. Chas. Zimmermann & Co., 9 & 10, St. Mary-at-Hill, E.C., are the agents.

Alni Glutinosæ (Fluid Extract).—This is made from fresh alder leaves; and has been strongly recommended for use in cancer, its effect being to relieve pain and cachexia. Messrs. C. J. Hewlett & Son, Ltd., 35–42, Charlotte St. E.C.

Ammoline.—A combination of acetanilide with stimulating alkaline aromatics, which does not produce the depression which frequently follows the administration of acetanilide. Prepared by Messrs. Ferris & Co., Bristol.

Anæsthetic, Dental.—The "Grevillite" dental anæsthetic is guaranteed to contain less than 1 per cent of cocaine, the other ingredients being iodine, camphor, menthol, gaultheria, and antiseptics. The usual dose for tooth extraction is 10 to 15 min. A bottle containing one ounce costs 2/–. A special syringe is supplied for dental cases which is all metal, and costs 9/6, including a one-ounce bottle of the anæsthetic. This is sent out by the Medical Supply Association, 228 230, Gray's Inn Road, London, W.C. The same firm have more recently issued a local anæsthetic for surgical purposes containing only ½ per cent of cocaine, experience having proved that this was quite sufficient for the soft tissues. This is called the "Grevillite" Antiseptic Local Anæsthetic.

Aromatic Ammonia.—Messrs. Burroughs, Wellcome & Co. have produced a "Vaporole" which is a convenient means of instantly obtaining a solution of ammonia gas with aromatics ready for immediate use in emergency. It is far more reliable than ordinary smelling salts, which rapidly deteriorate.

Each "vaporole" contains a convenient quantity of solution in a capsule surrounded by absorbent material, the whole being enclosed in a covering of silk. When required the capsule may be fractured by pressure between the fingers, and the vapour inhaled.

Arsacetin.—This is an arsenic salt which is chemically called an "a-sanilate." It appears as a white powder, which dissolves in cold water 1 per cent and hot water 30 per cent. It is quite free from arsenious and arsenic acid. It has been investigated by Prof. Neisser, of Breslau University, who uses it for hypodermic injection in cases of syphilis; one of its great advantages for the purpose is that it is not decomposed by boiling. He uses twenty injections of 9 gr. each week, two injections on two successive days until twenty have been given. He does not discard mercury, but combines both drugs, using them simultaneously or successively. Further knowledge is necessary before the exact position of arsacetin can be fixed; but at present it is established that its toxicity is low, that it is a sterilizable solution of arsenic, and that it does not undergo decomposition by keeping. Messrs. Meister, Lucius & Brüning, Ltd., 51, St. Mary Axe, E.C., are the wholesale agents, both for this drug and "Sabromin" (which see).

Arylarsonates.—The new arylarsonates have been introduced by Messrs. Burroughs, Wellcome & Co. under the trade-mark of "Soamin" and "Orsudan." In the treatment of syphilis, sleeping-sickness, malaria, and other protozoal diseases, the low toxicity of these salts enable physicians to administer comparatively large quantities of arsenic without any toxic effects.

"Soamin" (Sodium Para-aminophenylarsonate) is stable, uniform in action, soluble in about five parts of water, and gives a neutral solution which can be sterilized. It contains 22·8 per cent of arsenium in organic combination, and has less than one-fortieth the toxicity of arsenious acid. Results of the administration of "Soamin" in cases of syphilis demonstrate the great therapeutic value of this agent.

"Orsudan" (Sodium 3-methyl-4-acetylaminophenylarsonate) is anhydrous. It is soluble in three times its weight of water, and gives a neutral solution. It contains 25·4 per cent of arsenium. The results of recent experiments suggest that "Orsudan" in doses of 0·05 gram, injected daily for five to seven days, will be of marked value in malaria.

It is important to note that the arylarsonate salts should not be given by the mouth, as they are decomposed by the acid contents of the stomach, and the effects of over-treatment by arsenic are thus more easily produced. Freshly prepared solutions should be administered by subcutaneous or intramuscular injection, preferably the latter. "Soamin" should not be used simultaneously with mercury, nor administered until fifteen days after mercurial treatment has ceased.

Aseptura Co. (Elixir).—For the treatment of cystitis and affections of the genito-urinary tract, an elixir containing 10 gr. of aseptura combined with corn-silk, saw palmetto, and sandalwood, has proved very efficacious. Messrs. R. Sumner & Co., of Liverpool, are the manufacturers.

Autan.—By the introduction of a self-developing formaldehyde disinfector, which requires no heating apparatus to develop both formaldehyde and steam, The Bayer Co., Ltd., have rendered a distinct service to preventive medicine. Rooms are more likely to be disinfected when nothing more is needed than to mix two dry powders together in a washing-tub, and then add water to them. Nor is it expensive, as 6d. will disinfect a room of 100 cubic feet; while one of 750 cubic feet will cost 2/5. The brisk chemical combination which takes place when water is added, causes volumes of steam to be given off, which penetrates every crevice with formaldehyde.

Cascara Fluida.—An excellent preparation of cascara sagrada is made by Messrs. Reynolds & Branson, of Leeds. On account of its palatability, as

well as its efficient purgative action in moderate doses, children take it readily, and it does not produce unpleasant griping action. It is prepared from well-matured bark by means of percolation with a suitable menstruum, and afterwards concentrated in vacuo.

Ceriden.—The use of ceriden, the active principle of yeast, is steadily increasing, both for internal and external use. Pessaries containing 5 per cent of ceriden are used for endometritis, leucorrhœa, and cervical catarrh, while capsules are given internally, chiefly for acne and furunculosis. Messrs. R. Sumner & Co. (as agents for the manufacturers) prepare both.

Claroma.—This is a combination of antiseptics and essential oils, which when inhaled has a pleasant effect upon the nasal mucous membrane, tending to clear the passage, allay irritation, and check secretion. It is quite a nice thing to use when suffering from a cold in the head, and in such cases a few drops sprinkled on the pillow at night will surround the patient with a pleasant vapour of an antiseptic character. It is made by Mr. J. M. Bannerman, 28, Newington Road, Edinburgh.

Cocillana Compound Syrup.—This is a combination made by Messrs. Parke, Davis & Co. as a bronchial sedative, which at the same time facilitates expectoration and maintains an effective action of the bowels. It is perfectly distinct in composition from any other preparation for the treatment of laryngeal and bronchial inflammation. Cocillana is a South American drug which possesses the valuable properties of ipecacuanha, and, in addition, a tonic and a laxative action. With it are associated euphorbia pilulifera (respiratory stimulant), wild lettuce (anodyne and antispasmodic), cascarin (tonic and laxative), menthol, heroin, squill, senega, and tartarated antimony. The syrup is very agreeable in flavour; it is not known to the public, but is supplied for dispensing purposes solely.

Codrenine Rx "B."—A local analgesic and ischæmic combination whose active ingredients are in somewhat different proportions from those obtaining in codrenine as hitherto supplied, which in future will be designated as "Codrenine Rx 'A'." Codrenine Rx "B" contains 1 per cent of cocaine hydrochloride with 1–5000 of adrenal in chloride in physiological sodium chloride solution, preserved with chloretone. If kept in air-tight bottles, codrenine retains its activity indefinitely. The amponles of 0·5 cc. are specially safe and convenient, as one contains sufficient for use in dental extractions. For infiltration anæsthesia over a larger area, it is usually diluted with nine times its volume of physiological sodium chloride solution, and for such purposes the bottles of 10 cc. or 1 ounce will be useful. It is manufactured by Messrs. Parke, Davis & Co.

Concentrated Fluid Extracts.—Messrs. Reynolds & Branson prepare a number of fluid extracts, and in their manufacture great care is exercised in selecting the crude drugs. Thorough exhaustion is procured by means of suitable media, which is afterwards concentrated in vacuo, thus retaining the therapeutic values of the drugs. Concentrated fluid extracts of belladonna, cinchona, ipecacuanha, and nux vomica are chemically standardized according to the B.P. requirements, whereas those of Indian hemp, digitalis, squill, etc., are physiologically tested by an expert pharmacologist. We have tried these extracts, and can recommend them with confidence.

Concentrated Tinctures.—In order to meet the demand for more concentrated preparations than the tinctures of the Pharmacopœias, Messrs. Reynolds & Branson have carefully devised formulæ, using alcoholic menstrua of the proper strength to suit the particular drugs selected, so as to produce thorough exhaustion, perfect keeping properties, and uniform dosage. For export, hospital, and surgery use, these concentrated tinctures will be found very convenient and economical. The preparations are double the strength of the B.P. tinctures in therapeutic value, but the economy effected in spirit renders them very useful for dispensing purposes.

Coryfin.—Under this name The Bayer Co., Ltd., have introduced a new menthol ester which has proved valuable as a local anodyne in nervous headaches. It has also been used with success in common colds, by applying it to the mucous membrane with a brush; and in catarrh of the larynx, by gargling with tepid water to which a few drops of coryfin have been added.

Creosote Emulsion (Compound).—As an example of elegant pharmacy we can strongly recommend the emulsion of creosote which Mr. Thos. Stephenson, of Edinburgh, has sent to us. The importance of rendering a creosote preparation pleasant and palatable is well known to those who have to treat tuberculous patients.

Cresol, Soluble.—We have received a sample of soluble cresol from Messrs. R. Sumner & Co., of Liverpool. It has the great advantage over carbolic acid in the fact that it is less toxic and has not the same corrosive effect upon animal and vegetable tissues; also its germicidal co-efficient is four times that of carbolic acid. It is used in a $\frac{1}{2}$ to 1 per cent solution, and only costs 1s. a pint, and is still cheaper in bulk. The same firm also prepare ung. cresolis, which contains 4 per cent of cresol with a petroleum base. This is far superior to the ung. ac. carbol of the B.P. It is less irritating, and has great deodorant powers.

Diabetic Bread.—We have received from Messrs. Callard & Co., 74, Regent Street, W., two samples of bread for diabetics, called "Cellulon" and "Prolacto," both of which are quite free from starch. No doubt the diabetic patient will be glad to try them both, as the search for something which will take the place of ordinary bread is as endless as the effort of the manufacturer to meet the need. No firm has made greater efforts in this direction than Messrs. Callard & Co., and we hope their latest productions will help the patient to bear a dietary which can under no circumstances give the satisfaction of the baker's loaf of everyday life.

Elixir Lecithin.—Lecithin belongs to the class of phosphorized fatty substances which form a large proportion of the white and grey matter of the brain, the yolk of eggs, etc.; chemically it is choline distearyl-glycerophosphate, and it is a natural product. Lecithin acts as a nerve and brain stimulant, and excellent results have been obtained in the treatment of anæmia, patients gaining weight and assimilating more readily, while there is at the same time an increase in the number of red blood-corpuscles and in the activity of the leucocytes. It has also proved valuable in the treatment of tuberculosis, neurasthenia, and brain and nervous disorders. Elixir lecithin (Ferris) contains one grain of lecithin in each fluid drachm. Prepared by Messrs. Ferris & Co., Bristol.

Elixir Neurodyn. Conc.—This is an elegant combination of quinine, strychnine, caffeine, antipyrin, and gelsemine, with bromide of potassium and aromatics (containing $\frac{1}{60}$ gr. strychnine in each fluid drachm). It is indicated in neuralgia and neuritis. It is sent out by Messrs. Ferris & Co., Bristol, and will be found to be an efficient and reliable preparation.

Elixir Urisol Comp.—This is a valuable urinary antiseptic and a powerful uric acid solvent. In this elixir urisol is exhibited in combination with the sedative properties of sandalwood, the tonic properties of saw palmetto, and the diuretic properties of corn silk. Prepared by Messrs. Ferris & Co., Bristol.

Enzymes, Elixir of.—This is a combination in a concentrated form of the active principles of all the organs of digestion. It is found to quickly digest albumen, fat, and starch, and should prove of great value in the treatment of dyspepsia. The sample was received too late for us to be able to speak personally of its use, but we propose to give it an extended trial during the year. It is prepared by Messrs. R. Sumner & Co., of Liverpool.

"**Ergothe.**"—A reliable and stable preparation of sound ergot of rye, containing all the active principles in an unchanged condition. It is scientifically prepared in vacuo by an entirely new process, by which the therapeutic value is not impaired, and from experience of the results attained we are confident in recommending it as one of the best preparations of ergot procurable. It is manufactured by Messrs. Reynolds & Branson, Leeds.

Erythemol Ointment.—Messrs. R. Sumner & Co. inform us that this ointment has an enormous sale, although it has never been advertised. We ourselves have used it continuously since it first came under our notice. It is not only a perfect antiseptic application, but it is very soothing. We are fully convinced that ointments made by machinery and which receive a long-continued milling are much more satisfactory than those made extemporaneously by the retail chemist.

Ess. Gent. Co. Conc. (1 7).—In the preparation of the ordinary concentrated infusions, different results are often produced by apparent inattention to necessary details. In the case of ess. gent. co. conc., there is a danger of producing a preparation which is acid and devoid of the aromatic flavour of the adjuncts. To overcome this Messrs. Reynolds & Branson, Ltd., of Leeds, have adopted a process by which the therapeutic properties are fully maintained, and the resulting preparation is a decided improvement on previous formulæ.

Formanganate Disinfector.—A convenient portable outfit for effective formaldehyde disinfection without special apparatus or the application of heat. It comprises a bottle of formaldehyde solution and some briquettes of potassium permanganate, specially prepared to gradually evolve formaldehyde vapour when placed in any metal container. It has the great advantage that the vapour is evolved slowly and the process continues for some time. It is regarded with great favour by the leading sanitary authorities, both civil and military. Messrs. Parke, Davis & Co.

Fig. 157.

Formitrol Pastilles.—These form a pleasant method of utilizing formalin to disinfect the mouth and throat, and are useful both in infectious cases and as a means of preventing infection. They are made by Mr. A. Wander, 1 & 3, Leonard Street, City Road, E.C.

Formozone.—This is a simple and effective method of generating formaldehyde. A cone (*Fig.* 157) is suspended over a pail or other suitable vessel, and its extremity is lighted. Each cone gives out sufficient formaldehyde to disinfect a room of 1000 cubic feet. It is simple and inexpensive, as each cone only costs sixpence. We congratulate Messrs. Chas. Zimmermann & Co. upon the invention.

Glidine and Iodoglidine.—Glidine is the name given to an absolutely pure vegetable albumin obtained by special process from wheat grain. It contains in the dry substance about 95 per cent of albumin and about ·9 per cent lecithin. It is entirely free from nucleoproteids and other extractives, and is practically free from carbohydrates. It is easy of digestion and assimilation, and makes an excellent food in gouty and rheumatic cases. This proteid was discovered by Prof. Volkmar Klopfer, of Dresden, who found that it could be combined with many of the drugs in ordinary use, not only with the halogen group, such as iodine and bromine, but also with some of the metals, such as mercury, arsenic, and iron, the effect of such combination being that the drug appears to lose its toxic power, and is very gradually

absorbed. Thus, in its combination with iodine (iodoglidine) the iodine is not liberated by the gastric juice, but is slowly liberated and absorbed by the intestine, and is very gradually excreted. Clinical experience shows that iodoglidine is well tolerated in all cases, and that large doses become unnecessary because of the steady and continuous absorption of iodine which takes place. We believe that iodoglidine will play an important part in therapeutics, as it meets needed indications in treatment. We are all beginning to realize more clearly that it is not only the drug, but the physical condition of the drug, upon which its efficiency depends. Messrs. Menley & James, Ltd., Farringdon Road, London, E.C., are the British agents. A tin of glidine weighing about 12 oz. (including the tin) costs 5/-.

Glucaphen.—Glucaphen is a concentrated nitrogenous food substance, intended to afford the nourishment required by the reparative operations of living organisms. It is particularly designed to meet the requirements of patients who need stimulating food after an illness, and in all wasting diseases it is of great assistance as an adjunct to the daily diet. It contains the proteid ingredients of milk and wheat, viz., casinogen, glutenin, and gliadin, combined with suitable small doses of glycerophosphates. It may be prescribed as a separate ingredient in the daily dietary, but it can also be combined with almost any food at all meals. The ingredients of which it is composed being only such as can be readily assimilated, it may be given between meals as an extra item of food, or it may be added to a cup of cocoa or milk, or given with soup, broth, or custard, but it should not be administered with anything of an acid character. It is prepared by Mr. Frank A. Rogers, of 327, Oxford Street, W., and should prove a valuable addition to our dietetic resources.

Glycerin Heroin Co. Pastilles.—The following is a good combination for an irritable cough. Ammonium hypophosphite, prunus virgin., hyoscyamus, pinus strobus, tolu, glycerin, and heroin, gr. $\frac{1}{120}$. Messrs. Sumner & Co., of Liverpool, make pastilles containing the above. When allowed to dissolve slowly in the mouth they have a most soothing effect upon the mucous membrane, and at the same time assist expectoration.

Glycerin Suppositories (Solidified).—Messrs. Ferris & Co., of Bristol, make these in three sizes—for infants, children, and adults. Each suppository contains 95 per cent of pure glycerin, and is most efficient in use, as their shape makes them self-retaining.

Glycerophos. Co. (Elixir).—A preparation made by Messrs. R. Sumner & Co. contains, in addition to the glycerophosphate salts, diastase, pepsin, kola, and tinct. ignatiæ. This is quite a nice preparation, especially suited to nervous patients, and costs only 2s. a pound.

Glycerophos. Co. c. Hæmoglobin.—Messrs. C. J. Hewlett & Son, Ltd., have made a tablet preparation of this combination, each tablet containing 1 gr. of hæmoglobin in addition to the equivalent of 1 dr. of the syrup of the glycerophosphates. It is a useful preparation in anæmia and debility.

Gonococcus Vaccine.—Messrs. Burroughs, Wellcome & Co. have a vaccine which may be used in the chronic and later stages of gonorrhœa, in gonorrhœal prostatitis and gleet, and also in gonorrhœal rheumatism. The initial dose is usually 0·25 cc., equivalent to 250,000,000 organisms. Subsequent dosage is regulated by the constitutional effect.

Grape Juice ("Salvator").—The value of grape juice, unfermented, as an important article of diet, and also as a therapeutic agent, is increasingly appreciated. There are many cases of gout and eczema which appear to derive great benefit from the use of grape juice. In debility and nervous exhaustion the effects are undoubted. There are some salts and albumins which cooking or heat change beyond the reach of assimilability, and many

cases of nerve fatigue are due to the system becoming starved for want of such salts. It is here that grape juice can be given with such excellent results. The "Salvator" grape juice, for which Messrs. B. Kühn & Co., 16, Rood Lane, E.C., are the London agents, can be obtained as a Bordeaux or Burgundy, red or white, and also as a Sauterne. As the prices range from 1/6 to 2/- a quart bottle, the grape cure is placed within the reach of all. We have tried this grape juice, which is non-alcoholic, and find it quite palatable.

Grapelax.—Under this name a laxative has been produced which consists wholly of the essence of Greek currant grapes 93 per cent. and extract of cassia lanceolata 7 per cent. It is quite pleasant to the taste, and is taken by children without difficulty. It will meet many cases where a simple laxative is required. The dose is from 1 to 4 dr. It is sold by Grapelax, Ltd., 379, Strand, W.C.

Guaiacose.—This is a liquid guaiacol somatose, which, while containing the active antiseptic principle creosote, is free from smell or irritating properties. The effect of the combination is that the guaiacol is given off very slowly in the intestinal canal and the system is gradually brought under its influence. It has proved a very efficient preparation in the treatment of diseases of the respiratory system, especially pulmonary tuberculosis. It appears to have no depressing effect upon the heart, and is well tolerated by patients, who find it relieves the cough and expectoration. It is prepared by The Bayer Co., Ltd., 19, St. Dunstan's Hill, E.C.

Hordine (Liquid Malt).—Made by a special process which is the result of many scientific investigations and experiments, hordine contains all the digestive and nutritive principles of the finest winter-malted barley, and shows a diastasic strength of over 100° Lintner compared with 5° or less contained in ordinary commercial liquid extracts of malt, as proved by recent tests made by a well-known professor. Two tablespoonfuls contain more of the nourishing properties of malt than a quart of ale or stout, without their alcoholic content. "Hordine" is a true food, which is not only easily digested itself, but from its amylolytic power is a most powerful aid to the digestion of all starchy food (e.g., bread, potatoes, oatmeal, gruel, etc.): hence its extreme value in dyspepsia and wasting diseases, and in cases where there is loss of weight. It is easier and more pleasant to take than the old-fashioned thick, sticky extracts of malt, and possesses all their virtues without their objectionable characteristics; it also has the further advantage of being perfectly palatable. Messrs. Oppenheimer, Son & Co. are the manufacturers.

Hydrarg. Subchlor. (Hypodermica).—Messrs. R. Sumner & Co., of Liverpool, prepare Dr. Lambkin's formula for the hypodermic injection of calomel, and it has been extensively used, with satisfactory results. The maximum dose is ½ gr. once a week, and this is contained in 10 min. of the solution, which costs 1s. 6d. per ounce. They also prepare Dr. Lambkin's formula for the injection of the metal mercury: 10 min. equal 1 gr. of mercury. This is the maximum dose for one week.

Iodosol.—A non-staining and non-irritating solution of free iodine, of the same strength as linimentum iodi. It has no hardening action on the skin, and is readily absorbed without leaving any stain. It is thus a valuable application for inflamed joints, glandular swellings, chilblains, pleurisy, and rheumatism. Prepared by Messrs. Ferris & Co., Bristol.

Lac Magnesiæ.—This is a preparation of pure hydrate of magnesia, containing 3 gr. in each fluid drachm. It is agreeable to take, and may be safely administered to children. It is best given diluted with water. Prepared by Messrs. Ferris & Co., Bristol.

Lactic Ferments.—Messrs. Oppenheimer, Son & Co., Ltd., have cultures of the true Bulgaria bacillus for the production of the sour milk recommended by Prof. Metchnikoff. They send out this growth, twelve tubes in a box, for 4s. 6d., each tube being sufficient for a pint of milk. It is desirable that these tubes should not be stocked too long, but purchased as required.

Lactone Tablets.—These tablets, prepared by Messrs. Parke Davis & Co., furnish a pure culture of lactic acid bacilli in an active state, and in a form convenient for fermenting fresh milk. Considerable interest has been shown lately in the use of lactic acid milk in various gastro-intestinal disorders, and in the feeding of infants. Christinson (*St. Paul Medical Journal*, July 1907) states that "lactonized milk" produced remarkable improvement in weight and general condition in 108 cases of gastric disorders in infants from eight weeks to nine months old; when so indicated he modifies it by diluting with barley-, oatmeal-, or rice-water, or by the addition of sugar. He found it valuable, too, in adult cases of gastritis, indigestion, and inoperable cancer.

Liq. Buchu Conc.—In this preparation Messrs. Reynolds & Branson offer a highly concentrated preparation, which, when diluted in the proportion of 1–7, produces inf. buchu B.P. Prepared by this method it is found that the aroma and medicinal values of buchu leaves are maintained to a greater extent than in formulæ hitherto adopted.

Liquor Trypsin Conc.—Trypsin has been recommended by a number of authorities in the treatment of cancer. Messrs. Ferris & Co. have introduced a concentrated solution which may be administered either hypodermically, orally, locally, or as a surgical solvent.

Lithia Aperient (Compound).—Under the name of compound effervescent lithia aperient, Messrs. R. Sumner & Co., of Liverpool, have issued a granulated salt containing 50 per cent of the mixed sulphates of magnesium and sodium and 10 per cent of lithia citrate. It is excellently made, and the bitterness of the sulphates entirely got rid of. It is quite a pleasant drink, and an ideal laxative in cases of rheumatism and gout. It costs 1s. 6d. per lb.

Lithio-Colchicine Conc. (Mist.).—The following formula prepared by Messrs. R. Sumner & Co., Liverpool, has given excellent results in cases of gout: Colchicine salicylas $\frac{1}{6}$ gr., lithium salicylas 40 gr., lithium guaiacas 16 gr., hexamethylenetetramine 16 gr., ext. serenoæ serrulatæ liq. (saw palmetto) 80 min., aquæ ad 8 oz.

Malto-Hæmoglobin.—Messrs. James Woolley, Sons & Co., Ltd., of Manchester, prepare an excellent combination of malt with hæmoglobin, which has proved useful in many cases of anæmia and debility, especially when attended by loss of weight or feeble digestion. It is quite palatable.

Medinal.—This is a name given by Messrs. Schering to the sodium salt of veronal, which, being soluble, has many advantages over the well-known hypnotic. It is given in doses of $7\frac{1}{2}$ to 15 gr. Messrs. A. & M. Zimmermann, 3, Lloyd's Avenue, E.C., are the London agents.

Medulla Phosphates.—A combination of the glycerophosphates with red bone-marrow is quite a new pharmaceutical product, and one which is likely to be of material service in cases of debility and neurasthenia. We have employed it in cases where all forms of fat are not tolerated, and find it taken regularly with excellent results. As it contains no strychnine, it may be continued with advantage over long periods. Messrs. Jas. Woolley, Sons & Co., Ltd., of Manchester, are the manufacturers.

Milk of Magnesia (Phillips).—This is a hydrated oxide of magnesium made by the Chas. H. Phillips Chemical Co., of New York, and 14, Henrietta Street, London. The preparation is very superior to the old-fashioned calcined

magnesia, and is not liable to form concretions in the intestines. The value of milk of magnesia as a vehicle for the application of zinc, sulphur, or bismuth to the skin is often forgotten, but nothing holds them in suspension better. It is also useful to saponify essential or fixed oils when used as a local application.

Nastin.—A remedy used in the treatment of leprosy by Professor Dr. Deycke, of Hamburg. Pure nastin is a bacterial fatty substance, viz., a crystallizable and neutral fat (ester of glycerin). When injected into lepers it gives rise to a reaction closely resembling that produced by tuberculin in tuberculosis. Professor Deycke therefore looked for an agent possessing a fat-removing action, a process which directly prepares these bacilli for further disintegration (bacteriolysis), and selected benzoylchloride. In this combination (C_6H_5—COH) Nastin B is produced in three forms: B_0 the weakest, and generally used in nervous leprosy only; B_1—0·05 per cent—used in nodular leprosy; B_2—0·2 per cent—used in nodular leprosy in advanced treatment. Prof. Deycke has delivered a lecture on the subject before the London School of Tropical Medicine, and has now gone to British Guiana, where the Colonial Office have placed a leper asylum at his disposal. We hope to hear good accounts of this method of treatment. Messrs. A. & M. Zimmermann, of 3, Lloyd's Avenue, E.C., can supply the preparation.

Nursery Foods.—The series of foods by which Messrs. Alex. Robb & Co., 79, St. Martin's Lane, W.C., have attempted to solve the problem of infant feeding are not novelties, for they have been in use for many years. This is an advantage, because the theory which led to their construction has been amply confirmed by experience. As a fact these foods have been selected and preferred to others by many of the Royal nurseries. They begin with a *Soluble Milk Food*, which closely approximates the mother's milk, and which can be given to infants from birth until the child is four months of age. From then until the child is six or seven months old, *Milk Food No. 2*, prepared with fresh cows' milk, is given. At seven months *Robb's Nursery Biscuits* are introduced into the diet: they require no cooking and are easily absorbed. Or these can be replaced by *Robb's Nursery Biscuit Powder*. Both the milk foods are quite free from starch or cane sugar. We believe that many of our readers will be glad to know of these foods, especially in those cases where cows' milk given to infants disagrees, and some substitute is necessary. The biscuits and the milk food (No. 2) also make an excellent diet for aged people and invalids.

Ophthalmic Ointment in Gelatine Capsules.—These are little gelatine capsules containing a variety of ointments for ophthalmic use, and are particularly suited for this purpose, as they make direct application to the eyelid convenient, cleanly, and safe. Messrs. R. Sumner & Co., of Liverpool, stock the following formulæ: boric acid 20 gr. to 1 oz., argyrol 20 gr. to 1 oz., atropine 4 gr. to 1 oz., atropine and cocaine, āā 4 gr. to 1 oz., cocaine 4 gr. to 1 oz., eserine 2 gr. to 1 oz., hydrarg. oxid. flav. 4 gr. to 1 oz., hydrarg. oxid. flav. and cocaine āā 4 gr. to 1 oz., ung. Pagenstecher 10 gr. to 1 oz. Six capsules in a box (*Fig.* 158) cost 1s. 6d

Fig. 158.

Para-Lysol Tablets.—These tablets provide practically a solution of lysol, one tablet representing $\frac{1}{4}$ pint of a 1 per cent solution. For purposes of antisepsis or disinfection they are most convenient and very efficient. A sixpenny tube contains fifteen tablets, and we find such a tube in the surgical bag very useful. Messrs. Chas. Zimmermann & Co., 9 & 10, St. Mary-at-Hill, London, E.C. are the agents.

Phenol and Menthol Compound.—Messrs. Burroughs, Wellcome & Co. have a tabloid containing phenol $\frac{1}{4}$ gr., menthol $\frac{1}{2}$ gr., oil of cajuput 1 min., which will be found a pleasant and effective means of administering this gastric stimulant and antiseptic. This combination is useful to promote appetite and digestion, to relieve pain in dyspepsia, and to prevent or arrest fermentation in dilated stomach. The gelatin envelope preserves the contents from the action of the atmosphere, and the shape facilitates swallowing.

Phospho-Muriate of Quinine (Phillips).—This is an elegant preparation, containing in each drachm $\frac{1}{4}$ gr. quinine muriate and $\frac{1}{120}$ gr. strychnine, with phosphoric acid and the phosphates of potassium, magnesium, lime, and iron. It is supplied by the Chas. H. Phillips Chemical Co., New York, and 14, Henrietta Street, London.

Pulverettes.—This new invention resembles a pill, but consists of a frail chocolate and sugar shell, enclosing the medicament in the form of powder; when pressed between thumb and finger a slight click is heard like the breaking of an egg shell, and the powder is released. It is vastly superior to any ordinary pill or compressed tablet, the absence of excipient to mass the ingredients places it ahead of any pill yet produced, and its frail coating and consequent solubility in a powder form presents all the advantages of compressed drugs without their serious disadvantages. All powders usually prescribed in pills, cachets, compressed tablets, etc., can be made in pulverette form by Messrs. Oppenheimer, Son & Co., to whom all credit is due for the introduction.

Quinine Compound.—Under this name Messrs. Burroughs, Wellcome & Co. produce a tabloid containing cinchona alkaloids 1 gr., antifebrin (acetanilide) $1\frac{1}{2}$ gr., camphor monobromate $\frac{1}{5}$ gr., powdered ipecacuanha $\frac{1}{8}$ gr., cascara sagrada extract $\frac{1}{4}$ gr. This is valuable when changeable weather frequently involves exposure to risks of colds and catarrhal and bronchial affections. The antiseptic, antipyretic, expectorant, and laxative principles combine to assist the patient to combat the infection and cut short the febrile process. One may be taken every hour in the early stages of catarrh.

"**Roboleine.**"—This is a nutritive and digestive food, containing a palatable combination of red bone-marrow, expressed juice of calves' rib bones, and cream of malt, with hypophosphites of lime, soda, and potash. It has been prepared in response to enquiries and suggestions for a complete scientific food which would be at the same time perfectly reliable and palatable. It is suitable for all forms of malnutrition where it is desired to administer easily digested and potent tonic food. In phthisis and wasting diseases, anæmia, chlorosis, debility, etc., its exhibition increases metabolism, improves nutrition, and reinforces the natural resistance to disease. Messrs. Oppenheimer, Son & Co. are the manufacturers.

Royal Fachingen Natural Table Water.—As a table water Fachingen has a distinct advantage in the fact that it contains sufficient carbonic acid gas to give a sparkle and crispness to the water, and not enough to make it an effervescent drink. This is precisely what we want in a water for use with the meals. In reaction it is mildly alkaline, and it has a great reputation in Germany for disorders due to the uric acid diathesis. It is bottled under the supervision of the Prussian Government in its pure natural condition, and sold at the offices of the Royal Mineral Springs, 6, Great St. Helens, London, E.C.

Sabromin.—This is practically an insoluble and tasteless bromide preparation, which undergoes decomposition in the intestine, and gives all the effects of the bromide salts without danger of causing bromism. It has been used largely in Von Mering's clinic, with most satisfactory results. The usual dose is from 15 to 45 gr. a day. It is prepared in tablets of 7½ gr., which Messrs. Hewlett & Son, Ltd. supply at 4/- per 100. It can also be obtained from the agents, Messrs. Meister, Lucius & Brüning, Ltd., 51, St. Mary Axe, E.C.

Sapogen.—This is an active antiseptic liquid soap; it is specially prepared for the use of surgeons, accoucheurs, and bacteriologists, and is also adapted for general cleansing purposes. It lathers freely, and is specially useful on account of its power of penetrating below the surface of the skin. Sapogen is supplied in combination with a series of disinfectants and germicides, particulars of which can be obtained from Messrs. Ferris & Co., the manufacturers.

Saxol Spray.—Messrs. Ferris & Co. send us the following new formulæ for use with the saxol atomizer:—

In Hay Fever: R Quinine gr. x, Eucalyptol ℥iij, Thymol gr. iij, Ol. Gaultheriæ ℥ij, Saxol (Ferris) ʒiss.

In Asthma: R Cocaine gr. ii½ in ʒj, Atropine gr. ¼ in ʒj, Sodii Nitr., Aromatics, etc. This nearly approaches Tucker's specific. Another remedy in asthma is cocaine and belladonna, each 1 gr. to the ounce, stramonium, gaultheria, etc.

Septoforma.—This is a product of the condensation of formaldehyde with beta-naphthol and other bodies of the phenol group. It is used as an antiseptic in one to three per cent solution, and also as a soap. The solutions have a slight but not unpleasant odour of formalin. It does not stain the clothes or injure instruments. When applied to foul-smelling wounds it acts as a very efficient deodorant. Its alkalinity and somewhat astringent character render it an excellent mouth-wash. It has been used extensively on the Continent, and with very favourable results, during the past six years, and the Edinburgh surgeons have lately employed it largely. It is supplied by Union Limited, 17, Lauriston Place, Edinburgh.

Skin Lotions (Evaporating).—Messrs. C. J. Hewlett & Sons, Ltd., 35–42, Charlotte Street, E.C., have introduced a series of skin lotions which, when dabbed on the skin, rapidly evaporate and leave the medicament so closely adherent that it will hardly come away without washing. Every practitioner knows the value of the familiar calamine lotion, but these preparations have the great superiority of more rapid evaporation, of firmer cohesion of the particles, and a wider choice in the use of medicaments. The following are the stock lotions which Messrs. Hewlett prepare: lotio sulph. = 1 dr. to 1 oz.; lotio sulph. et picis carb., as above, with 10 per cent alcoholic solution of coal tar; lotio zinci = 12 gr. oxide of zinc to the ounce; lotio zinci co., as above, with 1 per cent resorcin and 5 per cent alcoholic solution of coal tar; lotio zinci et ichthyol = 5 per cent ichthyol added to lotio zinci. We think these preparations are a distinct addition to our therapeutic resources, and that the profession will be glad to use them in all cases where it is wished to continue the action of a medicament with protection from the air, and also to avoid the use of ointments.

Sodii Formatis Co. (Elixir).—Messrs. R. Summer & Co. have an elixir, each fluid drachm containing sodii formas 7½ gr., quinine ½ gr., iron ½ gr., strychnine $\frac{1}{100}$ gr. This makes a capital tonic, and costs 2s. 4d. a pound.

Soltabs.—Under this name Messrs. C. J. Hewlett & Son, Ltd., 35–42, Charlotte Street, E.C., have introduced a number of compressed pellets to facilitate the making of solutions, lotions, etc. They are made in a

distinctive shape to prevent confusion with pellets intended for *internal* use. This is a distinct advantage. As an example of the practicability of these soltabs, we may take one, "Nasal Sodium Bicarb. Co.," which is intended for nasal irrigation. It contains 5 gr. bicarb. soda, 5 gr. chlorate of sodium, 1 gr. boric acid, and 4 gr. borax. This makes an excellent combination for its purpose, and the soltabs only cost 9/– per 1000, or 1/– per 100. No more convenient way of prescribing or dispensing lotions could be devised. Messrs. Hewlet & Co. have a separate list of these soltabs, which is convenient for reference, and which they will supply on request.

Sterile Salt Tubes.—These contain, in a reliably aseptic condition, accurate quantities of chemically-pure salts for the production of one litre of physiological salt solution, according to the following formula: calcium chloride 0·25 gram, potassium chloride 0·10 gram, sodium chloride 9·00 grams, sterile water to make 1000·00 cc. This combination of chlorides has been adopted at the suggestion of Dr. Locke, of the Department of Physiology, Harvard University, U.S.A.; experience proves that it is more satisfactory than sodium chloride alone for the preparation of solutions for transfusion, and for the dilution of adrenalin chloride solution prior to intravenous, subcutaneous, or intraserous injection, or of "codrenine" or "eudrenine" for use in the production of infiltration analgesia over a large area. Being isotonic with the blood plasma, the solution has no injurious effects upon the red blood corpuscles, and therefore may be used hypodermically or intravenously with entire satisfaction. Cushny (*Pharmacology and Therapeutics*, 1906, p. 568) reports: "If a frog's heart be perfused with sodium chloride solution it ceases to beat. The addition of calcium and potassium salts will restore the action." And Dixon (*Manual of Pharmacology*, 1906, p. 315), writes: "An ideal salt solution is one in which the stimulating ions are mixed with a certain amount of positive ions, which, like calcium, restrain activity." Messrs. Parke, Davis & Co. supply the tubes in boxes of half-a-dozen.

Sterilla Liquid Surgical Soap.—The preference of surgeons for a liquid soap is not without reason, because it allows the *undiluted* antiseptic to be well rubbed into the skin before the hands are immersed in water. This tends to efficiency. We have examined "Sterilla" liquid surgical soap, which combines the properties of an energetic detergent and a potent germicide. It has a Rideal-Walker coefficient of 1, but is non-poisonous. It does not irritate or injure the skin, does not impair the sense of touch, mixes readily with water in any proportion, lathers well, is pleasant to use, and has no corrosive action on instruments. Sterilla is a convenient and effective cleansing and sterilizing agent for the hands, skin, and instruments, and is serviceable in surgery and midwifery. In dermatological practice it has many applications for cleansing the scalp or skin prior to the application of medicaments. A dilution 1–20 is used for filming and sterilizing laryngological and dental mirrors to prevent the interference of condensing moisture. As a general cleansing and disinfecting agent in the sick-room it has many notable advantages, being equal to pure carbolic but free from unpleasant or dangerous properties. We can strongly commend this liquid soap for use in hospitals and private practice. It is manufactured by Mr. Harold E. Matthews, Clifton, Bristol.

Strophanthome.—Strophanthome is an aseptic, non-alcoholic, non-irritating, and permanent solution of the active principles of strophanthus, freed as far as possible from extractive matter, and standardized by physiological test to a definite degree of activity. The fluid is preserved by a small quantity of chloretone, which also contributes a useful local sedative effect. Strophanthome is therefore perfectly well adapted for hypodermic administration, for which purpose the hermetically sealed ampoules in which it is supplied are very convenient; it may also be had in vials of 1 ounce. Strophanthome is twice the strength of the B.P. tincture of strophanthus, and whilst

more particularly intended for subcutaneous administration, it provides an absolutely reliable presentation of the drug for oral use. This is prepared by Messrs. Parke, Davis & Co.

Strychnine and Atropine.—Messrs. Burroughs, Wellcome & Co. have a tablet for hypodermic use containing atropine sulphate $\frac{1}{200}$ gr., strychnine sulphate $\frac{1}{100}$ gr., and one rather stronger. They are of service in the treatment of inebriety and narcomania. The hypodermic administration of small doses of atropine and strychnine for a few weeks has been found to create a repulsion to alcohol which is more or less lasting in character.

Theocin Co. (Elixir).—Messrs. C. J. Hewlett & Sons, Ltd., have introduced an elixir which contains in each drachm 2 gr. of Theocin Sod. Acetate and 5 min. of standardized tinct. of digitalis. This will form an excellent method of dispensing this diuretic, which has a powerful effect in the dropsy of both cardiac and renal disease.

Theosal.—This is a synthetic product of great value in cases of cardiac and renal dropsy. It possesses powerful diuretic properties, and is often successful where such heart stimulants as digitalis, strophanthus, and cactus grandiflorus fail. It has proved especially valuable in the treatment of dropsy. Its action is not cumulative, and there is no loss of effect when it is administered for a considerable time. It is supplied both in tablets and powder by Messrs. Ferris & Co., Bristol.

Thiopinol (Syn. Piutinol).—The piutinol sulphur bath, made artificially, consists of polysulphides and hyposulphites and the volatile oil of coniferous trees. A part of the polysulphide is precipitated in aqueous solution, without an addition of acid, in the form of milk of sulphur, whereby the bath obtains a milk-like appearance. The hyposulphite and a part of the polysulphide remain in solution. Thus we have the most effective degrees of sulphuration in the piutinol bath—milk of sulphur, sulphide, and hyposulphite. The volatile oils, which form a kind of emulsion in aqueous solution, are distributed uniformly through the entire bath, and act on the whole body. This makes a very effective and pleasant bath, and may be used in cases of gout, rheumatism, or skin disease with advantage. Messrs. A. & M. Zimmermann, 3, Lloyd's Avenue, E.C., are the London agents.

Thymoform Tablets.—Palatable compressed tablets presenting thymol and formic aldehyde in a non-irritating, pleasant, and effective form. When sucked slowly they exert a continuous bactericidal action, which is more lasting and effective than gargles in all septic conditions of the throat and mouth. It is also useful as a prophylactic for the use of doctors, nurses, and attendants exposed to infection. These are made by Messrs. Oppenheimer, Son, & Co.

Trilactine.—Under this name Mr. W. Martindale, of 10, New Cavendish Street, W., supplies lactic acid bacilli, for the treatment of intestinal fermentation due to pathogenic bacteria. The preparations are either in the liquid form or in compressed tablets. The object is to encourage the growth of lactic acid bacilli within the intestine, which have, according to Metchnikoff, the power to suppress the growth of *B. coli communis* and inhibit intestinal fermentation. The milk treated with trilactine is quite palatable, and the clinical results have been very satisfactory in many cases.

A simple apparatus is provided for 10s. 6d., by which the milk may be accurately prepared. Its construction will be understood from the diagram, and it consists of two metal chambers standing one over the other. In the upper is placed a jar containing a thermometer, by means of which the milk

contained in it is maintained at a temperature of about 40° C. for 8 hours. The heat is provided by means of a night-light which is placed in the lower chamber. (*Fig.* 159.)

Ordinary milk should be boiled, and afterwards kept at just below boiling point for half-an-hour, and then allowed to cool down to 40° C. before being put into the apparatus; but if pasteurized milk is employed, this may be boiled and cooled down to 40° at once.

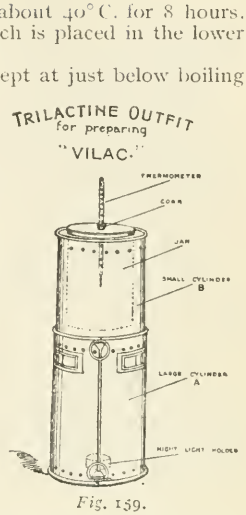

Fig. 159.

Tuberculin (Bovine).—The tuberculin recommended by Dr. Nathan Raw for the treatment of phthisis pulmonalis can now be obtained from Messrs. R. Sumner & Co., of Liverpool. The treatment consists of twelve injections, commencing with 0·0001 mgram, and gradually increasing. The twelve injections are sold for 15s. 6d. net.

Ung. Resorcin Co.—This ointment, prepared by Messrs. Jas. Woolley, Sons & Co., Ltd., of Manchester, is not a new pharmaceutical product—we have used it for many years. It has a stiff consistency, and is particularly soothing in all forms of irritable skin. We find it invaluable.

Vaccines.—Messrs. Parke, Davis & Co. are the sole agents forthe bacterial vaccines prepared in the laboratory of St. Mary's Hospital, London, under the supervision of the Director, Sir Almroth E. Wright. These vaccines are put up in hermetically sealed glass bulbs of about 1 cc., and for hospital use in bottles of 25 cc. The following kinds and strengths are supplied:—

Staphylococcus Vaccine: applicable in ordinary furunculosis, suppurating acne, staphylococcic sycosis, and other forms of staphylococcus infection, in three dilutions, respectively 100, 200 and 500 millions of staphylococci per cc.

Streptococcus Vaccine: applicable in streptococcal lymphangitis, erysipelas, and other strictly local forms of streptococcus infection, in two dilutions, respectively five and ten millions of streptococci per cc.

Gonococcus Vaccine: applicable in chronic gonococcal rheumatism, in two dilutions, respectively five and ten millions of gonococci per cc.

Tubercle Vaccine: a tubercle bacillary emulsion applicable in chronic, strictly local, and apyrexic tuberculous infections, in two dilutions, respectively $\frac{1}{2000}$ and $\frac{1}{5000}$ mgram of the comminuted tubercle culture per cc.

Typhoid Vaccine: for preventive inoculation, in two dilutions, respectively 1000 millions (for first dose) and 2000 millions (for second dose) of bacilli per cc.

The Wimpole Institute, under the direction of Dr. R. W. Allen, prepares a wide series of vaccines from specially selected bacteria, and these have an extended range of dosage, each being contained in a convenient bulk, i.e., 12 to 13 min. Amongst those supplied are staphylococcal vaccine (albus or aureus), streptococcal, pneumococcal, and gonococcal vaccine, tuberculin (human or bovine), *Bacillus coli communis*, typhoid and dysenteric vaccines, bacillus of Friedlander, *Micrococcus catarrhalis* cerebrospinal meningitis vaccine, and vaccine for colds. Mr. W. Martindale, 10, New Cavendish Street, W., is the agent.

Valisan.—This is a combination of bromine and bornyval, the latter being the essential principle of valerian. It has been used in cases of neurasthenia, and has proved an effective sedative without exercising hypnotic properties.

It is put up in gelatin perles of 4 gr. each, and produces no ill effects even in large doses. Messrs. A. & M. Zimmermann, 3, Lloyd's Avenue, E.C., are the agents.

Veronal (Soluble).—The disadvantage of all the hypnotics of which veronal is a type is their lack of solubility, which gives uncertainty as to the time of their therapeutic action. The Bayer Co., Ltd., by the introduction of veronal-sodium, have placed at our disposal a hypnotic the qualities of which are already known, but which is soluble in cold water (1–5). The solution has an alkaline reaction and the bitter taste of veronal. It is put up in powder form, and also in tablets of $7\frac{1}{2}$ gr., prepared with a basis of cocoa.

Viburnum Compound, Tablets of.—Each tablet contains the equivalent of 15 min. of "liquor viburni sedativus," which is a uterine sedative, tonic and anodyne, containing *Viburnum prunifolium*, *Hydrastis canadensis*, and *Piscidia erythrina*, with aromatics. Supplied by Messrs. Ferris & Co., Bristol.

"**Wychodyne.**"—A powerful astringent and anodyne, distilled in U.S.A. from genuine *Hamamelis virginiana*, and is suitable for internal and external use. It is a much more active preparation of the volatile principles of witch hazel than is ordinarily obtainable. It is perfectly cleanly in use, is free from toxic effects of any kind, and contains no methyl alcohol, formaldehyde, colouring, or inert matters. It is made by Messrs. Oppenheimer, Son & Co.

BOOKS OF THE YEAR.

A List of the Principal Medical Works and New Editions Published during 1908.

*** *For the convenience of our readers any of the works in this list can be obtained from Messrs. John Wright & Sons Ltd., "Medical Annual" Offices, Bristol.*

AMBULANCE AND NURSING.

Ambulance Work. Questions and Answers upon "First Aid to the Injured." By John W. and John Martin. 16th ed. 16mo, pp. 108 *Ballière* - - - - - - - - - - - - *Net* 1*s.*

Attendants on the Insane: Handbook for. 5th ed., revised and enlarged. Cr. 8vo, pp. 406. *Baillière* - - - - - - - *Net* 2*s.* 6*d.*

Diabetic Diet and Cookery: Manual of. By C. Herman Senn. Cr. 8vo, pp. 64. *Simpkin* - - - - - - - - - - *Net* 2*s.* 6*d.*

Dietetics in Health and Disease: Essentials of. A Text-Book for Nurses, etc. By Amy E. Pope and Mary L. Carpenter. Cr. 8vo, pp. 262. *Putnam* - - - - - - - - - - - - 5*s.*

"First Aid" to the Injured and Sick. An advanced Ambulance Handbook. By F. J. Warwick and A. C. Tunstall. 5th ed., revised and enlarged. 30th thousand. 12mo, pp. 268. *J. Wright & Sons Ltd.*
Leather wallet, Net 2*s.* 6*d. Boards, Net* 1*s.* 0*d.*

Guide to Sick Nursing in the Tropics. By Andrew Duncan. Cr. 8vo, pp. 170. *Scientific Press* - - - - - - - *Net* 2*s.* 6*d.*

Handbook for Nurses. With Examination Questions based on the contents of the chapters. By J. K. Watson. 4th ed., revised. Cr. 8vo, pp. 448. *Scientific Press* - - - - - - - *Net* 5*s.*

Home Nursing and Hygiene. By Florance Hufton-Windust. Cr. 8vo, pp. 130. *Black* - - - - - - - - - - *Net* 1*s.*

Medicine for Nurses: Practice of. By George H. Hoxie. 12mo, pp. 284. *W. B. Saunders* - - - - - - - *Net* 6*s.* 6*d.*

Mental and Sick Nursing. By Robert Jones. Cr. 8vo. Illus. *Scientific Press* - - - - - - - - - - - *Net* 3*s.* 6*d.*

Modern Nursing in Hospital and Home. A Short Course of Lectures to Probationers. By E. C. Laurence. Cr. 8vo, pp. 198. *Scientific Press* *Net* 2*s.* 6*d.*

Nursing: History of. By M. A. Nutting and L. L. Dock. 2 Vols. Illus. 8vo. *Putnam's Sons* - - - - - - - - *Net* 21*s.*

Nursing Mirror Pocket-Book. Containing much useful Nursing information. Imp. 32mo. *Scientific Press* - - - - - - *Net* 6*d.*

Nursing the Insane. By C. Barrus. 8vo. *Macmillan* *Net* 8*s.* 6*d.*

Nursing Times, The. Vol. III. 4to. *Macmillan* - - *Net* 6*s.*

Pharmacy and Dispensing for Nurses. By C. J. S. Thompson. New ed. Cr. 8vo. *Scientific Press* - - - - - - - - 1*s.*

Practical Nursing. A Text-Book for Nurses, etc. By Anna C. Maxwell and Amy E. Pope. Cr. 8vo, pp. 538. *Putnam's Sons* - *Net* 6*s.*

Primary Nursing Technique for First-Year Pupil Nurses. By Isabel McIsaacs. Cr. 8vo, pp. 218. *Macmillan* - - - - *Net* 3*s.*

Supplementary First Aid to Miners. By William B. Arthur. 12mo. *J. Wright & Sons Ltd.* - - - - - - - *Limp, 6d.*

ANATOMY AND PHYSIOLOGY.

Anatomy Pocket 6th ed. Revised and Edited by C. H. Fagge. Pp. 274. *Baillière* - - - - - - - - - - *Net* 3s. 6d.

Anatomy: Quain's Elements of. Edited by Edward A. Schafer and others. Vol. I.—Embryology, by T. H. Bryce. 300 Illus. Roy. 8vo, pp. 284. *Longmans* - - - - - - - - - - *Net* 10s. 6d.

Anatomy: Quain's Elements of. Vol. III. Neurology. By E. A. Schafer and J. Symington. Part 1. 301 Illus. Roy. 8vo. *Longmans* *Net* 15s.

Applied Anatomy: Surgical, Medical, and Operative. By John M'Lachlan. Revised and largely re-written by A. A. Scot Skirving. 2 Vols. 4th ed. Cr. 8vo, 265 Illus., pp. 532, 538. *Livingstone* *Net* 18s.

Applied Physiology. A Handbook for Students of Medicine. By Robert Hutchison. Cr. 8vo, pp. 310. *E. Arnold* - - - *Net* 7s. 6d.

Atlas of the Anatomy and Physiology of the Female Human Body: Baillière's Popular. With Text by H. E. J. Biss. Ditto, Male Human Body. Folio. *Baillière* - - - - - *Each, Net* 3s. 6d.

Body at Work, The. A Treatise on the Principles of Physiology. By Alex. Hill. Illus. 8vo, pp. 460. *E. Arnold* - - *Net* 16s.

Bone-Marrow: A Cytological Study. By W. E. Carnegie Dickson. Illus. 4to. *Longmans* - - - - - - - - *Net* 42s.

Bones of the Hands and Feet: Clinical Atlas of the Variations of the. By T. Dwight 4to. *Lippincott* - - - - - *Net* 21s.

Brain and Spinal Cord: Anatomy of the. By H. E. Santee. 4th ed. revised. 8vo, pp. 453, 128 Illus. *S. Appleton* - - *Net* 16s.

Cell (the) as the Unit of Life, and other Lectures delivered at the Royal Institution, London. 1899–1902. By Allan Macfadyen. Cr. 8vo, pp. 308. *Churchill* - - - - - - - - - *Net* 7s. 6d.

Early Development and Imbedding of the Human Ovum: Contributions to the Study of the. By Thomas H. Bryce, John H. Teacher, and John M. Munro Kerr Folio. pp. 102 and Plates. *MacLehose* *Net* 12s. 6d.

Experimental Morphology. By C. B Davenport. 8vo. *Macmillan* *Net* 15s.

Human Anatomy: Atlas and Text-Book of. By J. Sobotta. Edited, with additions, by J. Playfair McMurrich. Vol. III. Large 4to, pp. 250. 300 Illus. *W. B. Saunders* - - - - - - - *Net* 25s.

Human Physiology. By J. W. Ritchie. Cr. 8vo. *Harrap* 2s. 6d.

Hygienic Physiology: Lessons in. By W. M. Coleman. Cr. 8vo. *Macmillan* - - - - - - - - - 3s.

Landmarks and Surface Markings of the Human Body. By Louis Bathe Rawling. 3rd ed. 8vo, pp. 104. 31 Illus. *H. K. Lewis* *Net* 5s.

Notes on some Bushman Crania and Bones from the South African Museum, Cape Town. By C. F. Shrubsall. Imp. 8vo, pp. 43. *W. Wesley* - - - - - - - - - - 1s. 6d.

Pocket Osteology. By Philip Turner. 12mo, pp. 196 *Baillière* *Net* 3s.

Pocket Osteology. By Philip Turner. - - - *Net* 3s.

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Killarney.—*District Asylum*. Res. Med. Supt., E. W. Griffin, M.D. Asst. Med. Off., G. W. Downing, L.R.C.P. & S. Access—Killarney, ½ mile.

Kirkby Lonsdale.—*Greta Bank*. Res. Licensee, Mrs. Taylor. Access—Bentham (M.R.) 2 miles.

Kirkintilloch (near Glasgow).—*Westermains Private Asylum*. For ladies; quiet cases only received. Apply to Mr. Jas. Lawrie, Res. Proprietor. *See also p.* 859

Knowle (near Fareham).—*County Asylum*. Med. Supt., H. K. Abbott, M.D. Access—Knowle station, ⅛ mile.

Lancaster.—*County Asylum*. Res. Med. Supt., D. M. Cassidy, M.D. Access—Lancaster, L. & N.W. and Midland stations, each 1¼ miles.

Lancashire, nr. Newton-le-Willows.—*Haydock Lodge*, Private Mental Hospital. Res. Med. Prop., Dr. C. T. Street. Access—Newton-le-Willows, 2 miles. *See also p.* 855

Leeds (Menston, near).—*West Riding Asylum*. Res. Med. Supt., S. Edgerley, M.D. Access—Menston, 1 mile.

Leek (Stafford).—*County Asylum*, Cheddleton. Med. Supt., W. F. Menzies, M.D. Access — Wall Grange station, 1 mile.

Leicester.—*Borough Asylum*, Humberstone. Res. Med. Supt., J. E. M. Finch, M.D. Access—Leicester.

Leicestershire and Rutland Asylum. Res. Med. Supt., R. C. Stewart, M.R.C.S. Access—Narborough ¾ mile; Leicester, 7 miles.

Letterkenny.—*Donegal District Asylum*. Res. Med. Supt., E. E. Moore, M.D. Asst. Med. Off., J. C. Martin, L.R.C.S.I. Access—Letterkenny and Lough Swilley Rly., 1 mile.

Lichfield.—*County Lunatic Asylum*, Burntwood, near Lichfield. Res. Med. Supt., J. B. Spence, M.D.

Access—Lichfield City, 3½ miles; Trent Valley, 4½ miles; Hammerwich, 1½ miles.

Limerick.—*District Asylum*. Res. Med. Supt., Dr. E. D. O'Neill. Access—Limerick station, ½ mile.

Lincoln.—*County Asylum*, Bracebridge. Res. Med. Supt., Dr. T. L. Johnston. Access—2½ miles from Lincoln G.N.R. station.

The Lawn. Res. Med. Supt., Arthur P. Russell, M.B. Access—Lincoln stat. 1 mile. *See also p.* 865

Liverpool.—*Shaftesbury House*, Formby, near Liverpool and Southport. Res. Med. Supt., Stanley A. Gill, B.A., M.D. Access—Formby station, ¼ mile distant. *See also p.* 856

Tue Brook Villa, Liverpool, E. Res. Med. Supt., Dr. J. A. Cooke. (For 52 males and females). Access—Tue Brook station or Green Lane car. *See also p.* 869

London.—*Bethlem Royal Hospital*, St. George's Road, London, S.E. Res. Med. Supt., Theo. B. Hyslop, M.D., M.R.C.P.E. *See also p.* 867

Bethnall House, Cambridge Road, N.E. Res. Med. Supt., J. K. Will, M.D. Access—Cambridge Heath station.

Brooke House, Clapton, N.E. Props., Mr. H. T. Monro and Dr. J. O. Adams. Res. Med. Supt., Dr. Gerald Johnston. Access—Clapton, G.E.R.

Camberwell House, Peckham Road, S.E. Res. Med. Supt., F. H. Edwards, M.D., M.R.C.P. Asst. Med. Offs., G. H. Keene, B.A., M.D., B.Ch., and H. J. Norman, M.B., B.Ch. Telegrams, "Psycholia, London." *See also p.* 866

Chiswick House, Chiswick. Res. Lics., Dr. T. S. Tuke; Med. Supt., C. M. Tuke, M.R.C.S. Access—Chiswick station, ½ mile; Turnham Green station, 1 mile.

Clarence Lodge, Clapham Park, S.W. Prop., Mrs. F. Thwaites, B.A. Med. Off., Dr. G. F. Blandford. Access: Clapham Rd., and Clapham Common (Electric), 15 minutes. *See also p.* 865

Featherstone Hall, Southall. Res. Med. Lic., W. H. Bailey, M.D. Access—Southall station, 5 minutes.

Fenstanton, Christchurch Road, Streatham Hill. Res. Med. Supt., T. Duncan Greenlees, M.D., F.R.S. Edin. Access—Tulse Hill, 5 minutes, and Herne Hill, 15 minutes. *See also p.* 868

Flower House, Catford, S.E. Res. Med. Supt., C. A. Mercier, M.D. Access—C. & D. R. Beckenham Hill, 5 minutes.

Halliford House, Sunbury-on-Thames, S.W. Res. Med. Supt., W. J. H. Haslett, M.R.C.S. Access—Sunbury station, 1¼ mile.

Hayes Park, Hayes, Middlesex, near Uxbridge. Res. Med. Off., Dr. J. W. Higginson. Access—Hayes, 2 miles.

Hendon Grove Asylum (for ladies), Hendon. Med. Lic., F. W. Edridge-Green, M.D., F.R.C.S. Access—By M.R., Hendon station, ½ mile, or 'bus from Tube at Golder's Green.

London County Asylum, Banstead Downs, near Sutton, Surrey. Res. Med. Supt., D. J. Jones, M.D. Access—Belmont station, ½ mile; Sutton station, 1½ miles.

London County Asylum, Bexley, Kent. Res. Med. Supt., T. E. K. Stansfield, M.B. Access—Bexley station, 1¼ miles.

London County Asylum, Cane Hill, Coulsdon, Surrey. Res. Med. Supt., Dr. J. M. Moody. Access—Coulsdon, S.E.R., or Stoat's Nest, L.B. & S.C.R., 10 minutes.

London County Asylum, Claybury, Woodford, Essex. Res. Med. Supt., Robert Jones, M.D. Access—Woodford, 1½ miles.

London County Asylum, Colney Hatch, N. Res. Med. Supt., W. J. Seward, M.B. Access—New Southgate, G.N.R.

London County Asylum, The Manor, Epsom. Res. Med. Supt., W. Ireland Donaldson, M.D. Access—L. & S.W. and L.B. & S.C.R.

London County Asylum, Hanwell. Res. Med. Supt., Dr. P. J. Baily.

London County Asylum, Horton, Epsom. Res. Med. Supt., Dr. J. R. Lord. Access—L. & S.W. Rly. 1¾ miles.

London County Asylum, Long Grove, Epsom. Res. Med. Supt., C. H. Bond, M.D. Access—L. & S.W.R. and L.B. & S.C.R.

London County Colony, (Insane Epileptics), Ewell, Epsom. Res. Med. Supt., Dr. P. C. Sparks. Access—L. & S.W. & L.B. & S.C.R.

Middlesex County Asylum, Tooting, S.W. Med. Supt., H. Gardiner Hill, M.R.C.S. Access—Wandsworth Common station, 1 mile.

Moorcroft House, Hillingdon (males). Uxbridge, 2 miles; London, 13 miles. Med. Licensees, Dr. R. J. Stilwell, and Dr. R. H. Cole. Access—West Drayton station, 2 miles.

Newlands House, Tooting Bec Road, S.W. (for gentlemen). Lic. Prop., A. H. Sutherland. Med. Supt., H. J. Hind, M.R.C.S. Access—Balham station, 1 mile, and tram. *See also p.* 868

Northumberland House, Green Lanes, N. Prop., A. H. Stocker, M.D. Res. Med. Supt., Dr. Frank R. King. Access—Finsbury Park station, 1 mile. *See also p.* 858

Otto House, 47, North End Road, West Kensington (for ladies). Lic. Prop., A. H. Sutherland. Lady Supt., Mrs. Chapman. Access—West Kensington station, 1 mile. *See also p.* 868

Peckham House, Peckham, S.E. Prop., Alonzo H. Stocker, M.D. Res. Med. Supt., Harold C. Halsted, M.D. Access—Peckham Rye sta., 10 minutes' walk. *See also p.* 868

St. Luke's Hospital, Old St., E.C. Res. Med. Supt., Wm. Rawes, M.D., F.R.C.S. Convenient to principal London stations. *See also p.* 867

The Grange, East Finchley, N. Res. Licensees, Dr. F. and Mrs. Watson.

The Priory, Roehampton, S.W., near Richmond. Res. Med. Supt., James Chambers, M.D. Access—Barnes station, 10 minutes.

Vine Cottage, Norwood Green, Middlesex. Res. Med. Prop., H. C. Titterton, M.R.C.S. Access—Southall, 1 mile.

West Ham Boro' Asylum, Goodmayes, Ilford. Res. Med. Supt., Dr. D. Hunter. Access—Goodmayes, ¾ mile.

Wood End House, Hayes (ladies). Uxbridge, 3 miles; London, 12 miles. Med. Lic., Dr. H. Stilwell. Access—Hayes station, 1 mile.

Londonderry.—*District Asylum.* Res. Med. Supt., Dr. Hetherington. Access—Londonderry, 1 mile.

Macclesfield.—*Parkside Asylum.* Res. Med. Supt., T. Steele Sheldon, M.B. Lond. Access—Macclesfield, 1 mile.

Maidstone.—*Kent County Asylum.* Res. Med. Supt., H. W. Lewis, M.D. Access—Maidstone, 1½ miles.

Malling Place and *Winthies Cottage* (for ladies), and *Castle House* (for gentlemen). Res. Med. Supt., Dr. James Adam. Access—Malling station, 1 mile.

Market Lavington (Wilts).—*Fiddington House.* Prop., Major Reilly. Res. Med. Supt., Dr. J. Selfe Lush. Access—Lavington, 1½; Devizes, 6 miles.

Maryborough (Queen's County).—*District Asylum.* Res. Med. Supt., Dr. P. Coffey. Access — Maryborough, ½ mile.

Melrose, N.B. — *Roxburgh District Asylum.* Res. Med. Supt., J. C. Johnstone, M.D. Access—Melrose, 1 mile.

Melton. — *Suffolk District Asylum*, near Woodbridge. Res. Med. Supt., J. R. Whitwell, M.B. Access—Melton station, 1¼ miles; Woodbridge station, 2¼ miles.

Middlesbro'.—*County Boro' Asylum.* Res. Med. Supt., Dr. J. W. Geddes. Access—Middlesbro', 2 miles.

Monaghan (Ireland).—*District Asylum.* Res. Med. Supt., R. L. S. Donaldson, M.D. Access—Monaghan, ¼ mile.

Montrose, N.B. — *Montrose Royal Lunatic Asylum.* Phys. Supt., John G. Havelock, M.D. Access—Hillside, ¼ mile; Dubton, 1 mile.

Morpeth. — *Northumberland County Asylum.* Res. Med. Supt., Thos. W. McDowell, M.D. Access—Morpeth station, 1 mile, by 'bus.

Mullingar. — *District Asylum.* Res. Med. Supt., Dr. A. Finegan. Access—Mullingar station, 1 mile.

Nelson (Lancs.). — *Marsden Hall.* Licensee and Med. Supt., P. G. Mould, M.R.C.S. Access—Nelson station, L. & Y. Rly.

Newcastle-on-Tyne.—*City Asylum*, Gosforth. Res. Med. Supt., James T. Callcott, M.D. Access—Newcastle, 4 miles.

Northampton.—*Berrywood Asylum.* Res. Med. Supt., W. Harding, M.D. Access—Castle station, 2½ miles; Midland station, 3 miles.

St. Andrew's Hospital. Med. Supt., J. Bayley, M.R.C.S. Access—Northampton station, 1 mile.

Norwich.—*Heigham Hall.* Res. Phys. and Prop., J. G. Gordon-Munn, M.D. Access—Victoria station, 1 mile; Thorpe station, 1½ miles.

Norfolk County Asylum, Thorpe (1000 beds). Res. Med. Supt., D. G. Thomson, M.D. Access—Whitlingham, 1 mile; Norwich 2½ miles.

Norwich City Asylum, Hellesdon, near Norwich. Res. Phys. and Supt., Dr. David Rice. Access—Hellesdon, 1 mile.

The Bethel Hospital for the Insane. Res. Med. Supt., J. Fielding, M.D. Cons. Phys., Saml. J. Barton, M.D. Access—Norwich (Thorpe) station, 1 mile. *See also p.* 862

The Grove, Old Catton, near Norwich.—(For ladies only.) Res. Med. Supt., C. A. Osburne, F.R.C.S. Apply to the Misses McLintock.

Nottingham.—*City Asylum*, Mapperley Hill. Med. Supt., E. Powell, M.R.C.S.

Notts County Asylum. Med. Supt., A. M. Jackson, M.D. Access—Radcliffe-on-Trent, 2 miles.

The Coppice. Res. Med. Supt., W. B. Tate, M.D. Access—Midland station, 2½ miles; Gt. Northern & Gt. Central station, 1½ miles.

Omagh.—*District Asylum.* Res. Med. Supt., Geo. E. Carre, M.B. Access—Omagh station, 1½ miles.

Oxford.—*Oxford County Asylum.* Res. Med. Supt., T. S. Good, M.R.C.S. Access—Littlemore station.

The Warneford, Oxford, 1½ miles. Res. Med. Supt., James Neil, M.D. Access—Oxford station, 2½ miles.
See also p. 869

Paisley.—*Parochial Asylum,* Craw Road. Vis. Med Off., T. Graham, M.D.; Res. Med. Off., R. J. D. Davidson, M.B., Ch.B. Access—Paisley, 1 mile.

Parochial Asylum, Riccartsbar. Med. Off., D. Fraser, M.D. Access—Paisley West, ¼ mile.

Perth.—*District Asylum,* Murthly. Res. Med. Supt., Lewis C. Bruce, M.D. Access—Murthly.

James Murray's Royal Asylum, Perth (for private patients only). Phys. Supt., A. R. Urquhart, M.D., F.R.C.P. Ed. Access—Perth station, under 2 miles. *See also p.* 858

Plympton.—*Plympton House,* Plympton, South Devon. Res. Med. Supt., Dr. Alfred Turner. Access—Plympton, 1 mile; Marsh Mills, 2 miles; Plymouth, 5 miles.
See also p. 866

Portsmouth.—*Borough Asylum.* Res. Med. Supt., B. H. Mumby, M.D., D.P.H. Access—Fratton, 1½ miles.

Prestwich (nr. Manchester).—*County Asylum.* Res. Med. Supt., Dr. F. Perceval. Acc.—Prestwich, 1 mile.

Rainhill (near Liverpool).—*County Asylum.* Res. Med. Supt., J. Wiglesworth, M.D. Access—St. Helens, 2½ miles; Rainhill, 1 mile.

Rotherham (Yorkshire).—*The Grange,* 5 miles from Sheffield (for ladies). Con. Phys., W. C. Clapham, M.D. Res. Phys., G. E. Mould, M.R.C.S., L.R.C.P. Access—Grange Lane station, ¼ mile. *See also p.* 869

Salisbury.—*Fisherton House Asylum.* Med. Supt. and Res. Licensee, Dr. J. L. Baskin. Access—Salisbury station, 5 minutes. *See also p.* 865

Laverstock House. Med. Supt., Hy. J. Manning, M.R.C.S. Access—Salisbury, 1½ miles.

Sevenoaks (Kent).—*Riverhead House* (for ladies). Res. Med. Supt., Dr. Wm. H. Macartney. Access—Sevenoaks station, S.E.R., ¾ mile.

Shrewsbury.—*Salop & Montgomery Counties Asylum.* Res. Med. Supt., D. F. Rambaut, M.D. Access—Shrewsbury station, 2½ miles.

Sleaford.—*Kesteven County Asylum.* Med. Supt., J. A. Ewan, M.D.

Sligo.—*District Asylum.*—Res. Med. Supt., Dr. Joseph Petit. Access—Sligo station, 1½ miles.

Stafford.—*County Asylum.* Res. Med. Supt., Dr. J. W. S. Christie. Access—Stafford, 1 mile.

Institution for the Insane, Coton Hill. Res. Med. Supt., Dr. R. W. Hewson. Access—Stafford, 1 mile.
See also p. 861

Starcross (near Exeter).—*Western Counties Training Institution for the Feeble-minded.* Res. Supt., E. W. Locke. Access—Starcross station, G.W.R., 5 minutes.

Stirling.—*District Asylum,* Larbert. Med. Supt., Dr. R. B. Campbell. Access—Larbert, 1½ miles.

St. Albans (Hill End).—*Herts County Asylum.* Med. Supt., A. N. Boycott, M.D. Access—Hill End station, G.N.R., 2 minutes.

St. Leonards-on-Sea.—*Ashbrook Hall,* Hollington (for ladies). Res. Props., Mrs. Hitch and Miss Adams. Med. Supt., Dr. E. Kaye Smith. Access—Warrior Square station, 2 miles.

Stone (near Aylesbury).—*Bucks County Asylum.* Res. Med. Supt., H. Kerr, M.D. Access—Aylesbury station, 3¼ miles.

Sutton (Surrey).—*Chalk Pit House* (for ladies). Prop., Mrs. F. D. Atkins. Med. Supt., Dr. Reichardt.

Tamworth (Staffs.).—*The Moat House* (for ladies). Res. Prop., E. Hollins, M.A. Access—Tamworth ¾ mile.
See also p. 860

Taunton.—*Somerset & Bath Asylum*, Cotford, near Taunton. Res. Med. Supt., Dr. H. T. S. Aveline. Access—Norton Fitzwarren station, 2 miles.

Ticehurst (Sussex).—*Asylum.* Props., Drs. H. & A. Newington. Access—Ticehurst Road 3 miles, Wadhurst S.E. & C.R., 4 miles.

Tonbridge. — *Redlands.* Res. Med. Supt., W. A. Harmer, L.S.A. Access—Tonbridge junc., S.E. & C.R., 2½ miles.

Virginia Water. — *Holloway Sanatorium*, Hospital for the Insane. St. Ann's Heath. Res. Med. Supt., W. D. Moore, M.D. Asst. Med. Offs., T. E. Harper, L.R.C.P., G. W. Smith, M.B., C. E. C. Williams, M.B., Sheila M. Ross, M.D. Access—Virginia Water station, 5 mins. Seaside Branch, Hove Villa, Dyke Road, Brighton. Med. Off., E. Rivaz Hunt, M.D.

See also p. 859

Wadsley (near Sheffield). — *South Yorkshire Asylum.* Res. Med. Supt., W. S. Kay, M.D. Access—Wadsley Bridge, 1 mile.

Wakefield.—*West Riding Asylum.* Res. Med. Supt., W. Bevan-Lewis, M.Sc., L.R.C.P. Access—Kirkgate and Westgate station, 1 mile.

Wallingford (Berks).—*Berkshire Asylum.*—Res. Med. Supt., J. W. A. Murdoch, M.B. Access—Cholsey, 1 mile.

Warlingham (Surrey).— *Croydon Mental Hospital.* Res. Med. Supt., E. S. Pasmore, M.D. Access—Croydon, 6 miles; Upper Warlingham, 3¼ miles. *See also p.* 868

Warwick.—*Midland Counties Asylum*, Knowle, near Birmingham (for feeble-minded children). Sec. and House Gov., A. H. Williams. Med. Off., J. O. Hollick, M.B., M.R.C.S. Access—Knowle, ½ mile.

Waterford.—*District Asylum.* Res. Med. Supt., J. A. Oakshott, M.D. Access—G. S. & W. R., North station, 2 miles.

St. Patrick's Inst., Belmont Park. Conducted by the Brothers of Charity. Med. Supt., W. R. Morris, M.B.

Wells.—*Somerset and Bath Asylum*, Wells, Som. Res. Med. Supt., Dr. G. Stevens Pope. Access—Wells station, 2 miles; Masbury station, 2½ miles.

Whitchurch (Salop). — *St. Mary's House* (ladies only). Res. Med. Supt., C. H. Gwynn, M.D. Access—Whitchurch, 1 mile.

Whitefield (near Manchester).—*Overdale.* Res. Phys., P. G. Mould, M.R.C.S. Access—Prestwich and Whitefield station, 1½ miles; Molyneux Brow, ¼ mile.

Whittingham (nr. Preston).—*County Asylum.* Res. Med. Supt., Dr. J. F. Gemmel. Access—Grimsargh station, 1¾ miles; Whittingham station, 3 minutes.

Winchelsea (Sussex).—*Periteau*, near Hastings (5 ladies). Prop., Mrs. R. V. Skinner. Med. Supt., E. W. Skinner, M.D. Access—Winchelsea station, 1 mile.

Witham (Essex). — *The Witham Asylum* (Licensed for both sexes). Res. Med. Licensee, Dr. F. C. Payne. Access—Witham station, ¼ mile. *See also p.* 856

Woking. — *Surrey County Asylum*, Brookwood. Res. Med. Supt., Dr. J. E. Barton. Access—Brookwood station, 1¼ miles.

Worcester.—*County & City Lunatic Asylum*, Powick. Res. Med. Supt., Dr. G. M. P. Braine-Hartnell. Access—Worcester station, 4 miles.

York.—*The Pleasaunce* (ladies only). Prop. & Med. Supt., G. I. Swanson, M.D. Access—York, 1½ miles. *See also p.* 863

The Retreat. Res. Med. Supt., Bedford Pierce, M.D., F.R.C.P. (Lond.). Access—York station, 1½ miles. Also Throxenby Hall, a branch house, near Scarborough. *See also p.* 860

Bootham Park Registered Hospital, York. Res. Med. Supt,. C. K. Hitchcock, M.D., M.A. Cantab. Access—York station, 1 mile.

North Riding of Yorkshire Asylum, Clifton. Res. Med. Supt., A. I. Eades. Access—York, 2 miles.

TRAINING INSTITUTIONS.

Alton (Hants).—*Chaulos Lodge* (for backward and feeble-minded patients). Res. Med. Supt., Dr. Fletcher Beach. Access—Alton station, S.W.R., 15 minutes.

Bath.—*Magdalen Hospital School* (for backward and imbecile children). Med. Off., D. L. Beath, M.R.C.S. Clerk, E. N. Fuller, LL.B., 5, Old King St Bath. Ac.—G.W.R. 1½ ml.

Dublin.—*Stewart Institution*, Palmerston, Chapelizod, Co. Dublin (for imbecile children). Med. Supt., Dr. F. E. Rainsford.

Dundee.—*Baldovan Institution* (for the training, treatment and education of imbecile children). Matron, Miss Henry, Med. Supt., D. M. Greig, F.R.C.S. Access—Baldovan, 1 ml.

Kingston - on - Thames (Surrey).—*Normansfield, Trematon & Conifers* (for backward and feeble-minded of either sex). Res. Med. Supt., Dr. Langdon Down. Access—Hampton Wick station, 8 minutes.

Lancaster.—*The Royal Albert Asylum* (for the feeble-minded of the Northern Counties; 700 patients). Res. Med. Supt., Dr. A. R. Douglas. Secretary, Saml. Keir. Access—Lancaster station, 1 mile; and *Brunton House*, a Private Home in connection with the Royal Albert Asylum.

See also p. 864

Larbert (Stirlingshire). — *Scottish National Institution* (for education of imbecile children). Res. Supt., A. A. Skene. Med. Officer, Dr. R. D. Clarkson. Sec. & Treas., A. J. Fitch, Virginia Buildings, Glasgow. Access—Larbert station, ¾ mile.

London (Upper Norwood, S.E.).—*Grosvenor* (for boys), 84, Auckland Rd. Miss Arkell.

Southgate (Middlesex).—*Brook House* (for children). Res. Med. Prop., Harry Corner, M.D.

SANATORIA FOR CONSUMPTION, AND OTHER FORMS OF TUBERCULOSIS.

Aysgarth, R.S.O. (Yorks).—*Wensleydale Sanatorium.* Med. Supt., Edwd. M. Hime, M.B., Ch.B., Access—Aysgarth, ½ mile, via Northallerton, N.E.R., and Hawes Junction, M.R. *See also p.* 830

Banchory (Scotland).—*Nordrach-on-Dee.* Res. Phys., D. Lawson, M.A., M.D., W. W. Harrison, M.R.C.S., W. A. C. Ussher, M.D. Access—Banchory station, 2 miles.

Belbroughton (Worcs.). — *Midland Open - air Sanatorium,* Bourne Castle. Apply, Res. Phys., W. Bernard Knobel, M.A., M.D. Cantab., M.R.C.S., L.R.C.P. Access—Hagley, G.W.R.; Bromsgrove, M.R. *See also p.* 827

Benenden (Kent). — *Sanatorium* of "National Association for the Establishment and Maintenance of Sanatoria for Workers suffering from Tuberculosis." Res. Phys., W. D. Wilkins, M.R.C.S. Access—Biddenden station, 3 miles.

Bingley (Yorks.). — *Eldwick Sanatorium*, for females only. Vis. Phys., Dr. Margaret Sharpe. Access—Bingley station, 2 miles.

Bournemouth. — *Alderney Manor,* Parkstone. Res. Phys., Dr. W. Denton Johns. Access—Parkstone station, 2 miles.

Overton Hall, 6, *Poole Road.* Res. Prop., Dr. C. Guthrie Stein. Acc.—Bournemouth West, 7 mins.

Royal National Sanatorium for Consumption and Diseases of Chest. Sec., A. G. A. Major. Res. Phys., H. B. Dodds, M.D. Access—Bournemouth station, 1 mile. Terms 7/6 per week and a Governor's nomination.

The Firs Home (for advanced cases). Hon. Sec., Percy J. Duncan, M.D., Frogmore, Bournemouth. Hon. Med. Offs., P. J. Duncan, M.D., and S. G. Champion, M.D. Lady Supt., Miss MaGuire. Access Bournemouth Central, ½ mile.

The Home Sanatorium, West Southbourne, near Bournemouth. Res. Phys., J. E. Esslemont, M.B., Ch.B. Access — Bournemouth Central, 2½ miles; Boscombe, 1½ miles; Christchurch, 2½ miles.
See also p. 827

Bridge of Weir (Renfrewshire).—*Consumption Sanatoria of Scotland.* Hon. Sec., J. P. Maclay, Esq., 21, Bothwell Street, Glasgow. Med. Supt., John Guy, M.D. Access—Bridge of Weir, 2 miles.

Brighton. — *Municipal Sanatorium*, for Brighton townsfolk. Objects: educational, and for treatment of both early and advanced cases. Physician, Dr. Duncan Forbes, M.O.H. for Brighton. Particulars, Town Hall, Brighton.

Chagford (Devon).—*Dartmoor Sanatorium* (near Exeter, Newton Abbot, and Okehampton). Res. Med. Supt. and Prop., Dr. A Scott Smith. Access—Moretonhampstead, G.W.R., 6 miles; Okehampton station, L. & S.W.R., 11 miles.
See also p. 830

Cheddar (Somerset).—*Engel Home*, for women only. Med. Supt., R. W. Statham, M.R.C.S. Apply to Lady Supt. Access—Cheddar station, 10 minutes.

Cheltenham.—*Cotswold Sanatorium*, Res. Phys., Dr. F. K. Etlinger. Address — Cotswold Sanatorium, near Stroud.
See also p. 828

Salterley Grange Sanatorium, near Cheltenham. Res. Phys., Paul Mathews, M.D. Access—Leckhampton, 2½ miles.

Chiltern Hills Sanatoria.—*Kingwood* and *Maitland Cottage* (for working classes), Peppard Common, Oxon. Res. Med. Prop., Dr. Esther C. Carling. Access—Reading station, 6½ miles.

Clacton-on-Sea (Essex).—*Coppin's Green Sanatorium*. Res. Phys., Dr. J. E. Chapman. Access—Clacton-on-Sea, 1½ miles.

Crieff (Perthshire).—*Ellerslie Sanatorium*. Res. Prop., Thompson Campbell, M.D. Access—Caledonian Railway, Crieff station, ½ mile.

Darlington. —*Felix House*, Middleton St. George, Co. Durham. Med. Supt., C. S. Steavenson, M.B. Access—Dinsdale, 5 minutes.
See also p. 828

Devon and Cornwall *Sanatorium*, Didworthy, South Brent. For consumptive poor of the two counties. Hon. Sec., S. Carlile Davis, Esq., Princess Chambers, Princess Sq., Plymouth. Res. Med. Supt., A. H. Wylie, M.D. Access—Brent, G.W.R., 2 miles.

Dorking (Surrey). — *Woodhurst Sanatorium* (for Ladies and Girls only), Tower Hill. Sec., Geo. Wright. Visiting Phys., Miss Mary R. McDougall, M.B., C.M. Ed. Access—L.B. & S.C.R. and the S.E. stations, both about 1 mile.

Terms: from 1½ guineas weekly according to bedroom accommodation.

Dundee (nr.), *Sidlaw Sanatorium*, Res. Phys., Dr. A. K. Traill. Access—Auchterhouse stat. 1½ mls.

Durham.—*Durham County Consumption Sanatoria.* Sec., Mr. F. Forrest, 54, John Street, Sunderland. Terms free and by payment. For males: Stanhope, Med. Supt., Dr. John Gray. Access—Stanhope station, 1 mile. For females: Wolsingham, Med. Supt., Dr. Menzies. Access — Wolsingham station, ¾ mile.

Edinburgh.—*Royal Victoria Hospital for Consumption.* For the treatment of poor patients. Visiting Physicians, Dr. R. W. Philip and Dr. G. L. Gulland. Clerk and Treasurer, 4a, St. Andrew Square, Edinburgh.

Woodburn Sanatorium, Morningside. Res. Med. Prop., Mrs. I. Mears, L.R.C.P.I.

Eversley (Hants).—*Moorcote Sanatorium.* Res. Med. Supt., J. G. Garson, M.D. Access—Wellington College station, 4½ miles; Wokingham sta., 6 miles; Fleet, 6 miles.
See also p. 827

Farnham (Surrey). — *Crooksbury Sanatorium.* Res. Phys., Dr. F. Rufenacht Walters. Access—Farnham station, 3½ miles; Tongham, 2½ miles; Ash, 4 miles.
See also p. 829

Whitmead Sanatorium. Res. Phys., J. Hurd-Wood, M.D. Access—Farnham station, 3½ miles.
See also p. 829

Fortbreda, Belfast.—*Forster Green Consumption and Chest Hospital.* Res. Phys., Dr. Robert May. Sec., A. Shaw, 2, May Street, Belfast. Access—Belfast, 2 miles. Mainly for the poor; 6 beds free; others by small payment.

Frimley (Surrey).—*Brompton Hospital Sanatorium.* Res. Med. Supt., Dr. M. S. Paterson. Access—Frimley station, 2 miles.

Hastings. — *Fairlight Convalescent Home,* Old London Road, Ore, in connection with Margaret Street Hospital for Consumption and Diseases of the Chest (for Out-Patients), 26, Margaret Street, London, W. Sec., Alice M. Greg. Med. Off., Dr. N. F. Stallard. Access—Hastings, Tram, about 15 minutes. Payments, by subscriber's letter, 11/6.

Hull.—*Hull and East Riding Convalescent Home,* Withernsea. Sec., Benjamin Brooks, Royal Infirmary, Hull. Med. Off., A. E. Sproulle, L.R.C.P. Access—Withernsea stat.

Isle of Wight. — *Royal National Hospital for Consumption,* Ventnor. Res. Phys., Dr. James Gilchrist. Sec., Ernest Morgan, 34, Craven Street, Charing Cross, W.C. Terms 10/- per week and a recommendation from Governors. Access—Ventnor, 1 mile.

St. Catherine's Home, Ventnor (for advanced cases). Apply to Sister Bernardine. Med. Officer, H. F. Bassano, M.A., M.B. Access—Ventnor, 5 mins. drive. Terms, by selection, 10/6 per week.

Kingussie (Inverness-shire, Scotland).—*The Grampian Sanatorium.* Physician, Walter de Watteville, M.D. Access—Main Highland Rly., Kingussie, ¾ mile.

Kinross-shire (Scotland). — *Ochil Hills Sanatorium.* Sec., D. Hill Jack, 141, West George St. Glasgow. Med. Supt., J. Eric Wilson, M.D. Access—Kinross junction, 4 miles.

Kirkmichael (Scotland).—*Knocksultach.* Med. Supt., Mary F. Nannetti, L.R.C.P. Access — Blairgowrie station, 13 miles, by coach.

Leeds. *Leeds Sanatorium for Consumptives,* Gateforth, near Selby, and *Leeds Hospital for Consumptives,* Armley. Sec., C. H. Sedgwick, 37, Great George St., Leeds. Terms free, for poor of Leeds.

Liverpool.—*Liverpool Sanatorium for Consumptives,* Kingswood, Frodsham. Sec., Alfred Shawfield, 77*a*, Lord St., Liverpool. Res. Phys., Dr. H. H. Thomson. Access—Frodsham station, L. & N.W.R., 3½ miles.

London.—*City of London Hospital for Diseases of Chest,* Victoria Park, E. Open-air treatment provided. Sec., H. Dudley Ryder.

Mount Vernon Hospital for Consumption and Diseases of the Chest, Hampstead. Access—Finchley Road (Met.) station, 1 mile. *Country Branch Hospital at Northwood.* Access—Northwood (Met. & G.C. Rly.) Hon. Vis. and Res. Staff. Free on recommendation of governors. Secretary, W. J. Morton.

Royal Hospital for Diseases of the Chest, 231, City Road, E.C. Med. Off., A. S. Hosford, M.R.C.S. Apply to the Secretary.

Long Stratton (Norfolk).—*Fritton Open-Air Colony,* The Beeches. Med. Director, Dr. Annie McCall. Apply, Lady Superintendent. Access — Forncett station, G.E.R., 4 miles.

Maldon (Essex).—*The Sanatorium.* Med. Off., H. L. Ewens, M.D. Access—Maldon East, 1½ miles.

Manchester.—*Hospital for Consumption and Diseases of Throat and Chest.* Hospital at Bowdon; Crossley Sanatorium, Delamere, Cheshire. (For poor and working classes, after personal examination at Manchester.) Sec., C. W. Hunt, Manchester. Res. Phys. (Bowdon), A. H. Norris, M.R.C.S. (Delamere), D. Lloyd Smith, M.B. Access—Bowdon: Altrincham station, ½ mile. Delamere: Mouldsworth or Frodsham, 3½ miles.

Margate (Kent).—*Royal Sea-bathing Hospital* (for Surgical Tuberculosis) Sec., A. Nash, 13, Charing Cross, S.W. Access — Margate West, ¼ mile. *See also p.* 828

Meathop (near Grange).—*Westmoreland Sanatorium.* Res. Med. Supt., T. H. J. E. Hughes, M.R.C.S. Hon. Sec., Dr. W. Rushton Parker, Kendal. Access — Grange-over-Sands station, 2¾ miles.

Mendip Hills.—*Mendip Hills Sanatorium*, Wells, Somerset. Res. Phys., D. J. Chowry Muthu, M.D. Access—Wells station, 2¾ miles. *See also p.* 827

Mendip Hills.—*Nordrach-upon-Mendip*, Blagdon, near Bristol. Res. Phys., R. Thurnam, M.D. Access —Burrington station, 5 miles.

Nayland (Suffolk). — *East Anglian Sanatorium*, and *Maltings Farm Sanatorium* for poor men and women patients. Med. Supt., Dr. Jane Walker, 122, Harley Street, W. Access—Bures station, G.E.R., 3½ miles.

Norfolk.—*Kelling Sanatorium*, Holt. Assistance given to poor patients unable to pay. Hon. Sec., Dr. H. W. McConnel. Res. Med. Off., Mr. W. J. Fanning. Access—Holt station, Norwich.

Mundesley Sanatorium, Mundesley. Res. Physician, S. Vere Pearson, M.B. Access—Mundesley station, 1 mile.

Nottingham.—*Sherwood Forest Sanatorium*, Mansfield, for persons of limited means, resident in Notts and district. Sec., G. Sheldon, 36*a*, Bridlesmith Gate, Nottingham. Res. Med. Off., Miss Ida E. Fox, M.D. Access—Mansfield, 3 miles. Free, or 10/- per week, on recommendation of subscribers.

Ockley *Sanatorium* (Surrey). Res. Phys., Dr. Clara Hind. Access—Ockley, L.B. & S.C.R., 1 mile.

Painswick (Glouc'stershire). *Painswick Sanatorium, Cotswold Hills.* Res. Phys. and Prop., W. McCall, M.D. Access — Stroud, 4 miles; Gloucester, 6 miles.

Peebles.—*Manor Valley Sanatorium*, for patients with limited means. Apply Medical Superintendent.

Penmaenmawr (N. Wales).—*Nordrach in Wales, Pendyffryn Hall.* Res. Med. Prop., Dr. G. Morton Wilson. Access—Penmaenmawr station, 2 miles; Conway, 3 miles.

Ringwood (Hants).—*Linford Sanatorium.* Props. and Res. Phys., R. M. Smyth, M.D., and H. G. Felkin, M.D. Access—Ringwood station, 2½ miles.

Rockbrook (Co. Dublin).—*Larch Hill Sanatorium*, The Pine Forest. Res. Phys. and Prop. Dr. Leopold A. Hare. Access—Dublin.

Rudgwick (Sussex). — *Rudgwick Sanatorium.* Vis. London Phys., Dr. Annie McCall. Access—Rudgwick station, 5 minutes; Horsham station, 7 miles.

Ruthin (N. Wales).—*Vale of Clwyd Sanatorium, Llanbedr Hall.* Res. Props., Drs. G. A. Crace-Calvert and C. E. Fish. Access—Ruthin station, 2 miles.

Sandon, near Chelmsford (Essex).—*Merivale Sanatorium.* Res. Phys., H. N. Marrett, M.R.C.S. Access—Chelmsford stat., G.E.R., 3½ miles.

Skipton (Yorks). *Eastby Sanatorium*, for males. Conducted by Bradford Board of Guardians. Med. Supt., B. H. Slater, F.R.C.S. Res. Phys., J. T. Crowe, L.M.S.S.A. Access—Embsay station, 2 miles.

St. Leonards.—*Eversfield Chest Hospital*, West Hill. Hon. Sec., Geo. E. Hopwood. Res. Phys., T. Gambier, M.D. Fee, 10/- weekly, with subscriber's letter, available 4 weeks. Access—West St. Leonards S.E.R., West Marina L.B. and S.C.R., within 5 minutes' walk.

Torquay.—*Mildmay Consumptive Home* for advanced cases only. Hon. Med. Offs., F. D. Crowdy, M.D., and H. P. Wiggin, M.R.C.S. Hon. Sec., Miss F. Gumbleton, Connemara, Torquay. Access—Torquay, 1 mile. Fees, 10/6 weekly, or 7/- with subscriber's letter.

Western Hospital. Open Oct. to May. Sec. F. Manley. Terms, 7/6 by nomination, 12/6 without.

Warrenpoint (Co. Down).—*Rostrevor Sanatorium.* Res. Phys., B. H. Steede, M.D. Access—Warrenpoint. *See also p.* 830

Wicklow.—*Altadore Sanatorium,* Kilpedder, Co. Wicklow. Res. Phys., Dr. J. C. Smyth. Access—Dublin to Greystones, from which it is 5 miles.

The Royal National Hospital for Consumption for Ireland, Newcastle, Wicklow. Hon. Sec., J. R. Orpen, 13, South Frederick Street, Dublin. Res. Phys., L. T. Burra, M.B. Access—D. & S.E.R. to Newcastle, Co. Wicklow, 3 miles. Minimum fees, 7/- weekly, on subscriber's recommendation and medical examination.

Winsley, near Bath.—*Winsley Sanatorium.* Beds provided and supported by Bristol, Bath Swindon, Highworth, Cirencester, Trowbridge, and South Wilts (Salisbury), for poor patients. Paying patients also received. Res. Med. Off., Leonard Crossley, M.D. Sec., Frederick Jones. Access—Limpley Stoke station, 1 mile.

Wokingham.—*London Open-air Sanatorium.* Pinewood. Sec., H. W. Harris, 20, Hanover Square, W. Access—Wellington College, S.E.R., 2 miles; or Wokingham, S.W.R., 3½ miles.

Yelverton (South Devon). *Udal Torre Sanatorium.* Res. Med. Supt. and Prop., J. Penn Milton, M.R.C.S.

INSTITUTIONS FOR INEBRIATES.

LICENSED UNDER THE ACTS, 1879-1900.

The patient must sign a Form expressing a wish to enter the Home, before a magistrate. This can be done at the private residence of the patient, or at the retreat, if previous notice has been given. Two friends must also sign a declaration that they consider the patient an "Inebriate" within the meaning of the Acts.

* NOTE: Ashford and Chiswick are Roman Catholic Religious Institutions.
† Cinderford, Cradley Heath, Herne Hill, King's Lynn, and Torquay, are C.E.T.S. Institutions.

MALES ONLY.

Buntingford (Herts). — *Buntingford House Retreat.* Two Res. Physicians. Access—Buntingford, G.E.R., 8 minutes. *See also p.* 837

Cinderford† (Glos.).—*Abbotswood House Inebriate Reformatory,* for Male Inebriates. Res. Supt., F. Eardley-Wilmot. Access—Ruspidge or Newnham stations.

Cockermouth (Cumberland). — *The Ghyll Retreat.* Res. Med. Prop., Dr. Cooper. Access—Cockermouth, 11 miles.

Colinsburgh (Fife).—*Invernith Lodge Retreat.* Res. Med. Supt., Dr. J. Q. Donald. Access—Kilconquhar station, 4½ miles. *See also p.* 837

Dinas Mawddwy (Merionethshire).—*Plas-yn-Dinas.* Res. Med. Supt. and Licensee, Dr. W. F. Walker, J.P. Access—Cemmes Road, 8 miles; Dolgelly, 9 miles. *See also p.* 835

Folkestone.—*Capel Lodge,* near Folkstone. Res. Prop., E. Norton, M.D. Access — Folkestone Junction, 2 miles. *See also p.* 833

Rickmansworth (Herts).—*Dalrymple House.* Res. Med. Supt., F. S. D. Hogg, M.R.C.S., L.R.C.P. Access—Rickmansworth station, Great Central & Metropolitan Railway, ½ mile; L. & N.W.R., 1 mile. *See also p.* 833

FEMALES ONLY.

Ashford, near Staines.*—*Ecclesfield,* Apply to the Mother Superior. *See also p.* 834

Beverley (E. Yorks).—*Albion House.* Res. Supt., the Matron. Hon. Sec., Mrs. T. R. Pentith, The Limes, Sutton-on-Hull. Hon. Phys., Geo. Savage, M.D. *See also p.* 837

Brighton.—*Park Gate,* Preston Road. Lady Supt., Sister Mary. Med. Off., R. J. Ryle, M.D.

Chiswick.*—*St. Veronica's Retreat.* Under the care of the Sisters of Nazareth. Med. Supt., John J. Atteridge, M.D. Access—Chiswick station, ½ mile.

Cradley Heath† (Staffs). — *Corngreaves Hall.* Lic., Miss E. Eaves. Hon. Secretary, J. H. Broscomb, Lyncourt, Kingsbury Road, Erdington, Warwickshire. Access—Cradley and Old Hill stations, 1 mile.

Fallowfield. — *The Grove Retreat,* near Manchester. Licensee, Mrs. M. Hughes. Med. Offs., A. T. Wilkinson, M.D., and J. W. Hamill, M.D. Hon. Treas., S. Gamble. Access — Fallowfield station, 10 minutes. *See also p.* 831

Herne Hill.†—*Ellison Lodge,* Half Moon Lane. Res. Supt., Miss Corner. Med. Supt., Dr. P. Barham. Access—Herne Hill.

King's Lynn† (Terrington, St. Clement's). — *Hamond Lodge.* Res. Supt., the Sister in Charge. Med. Supt., S. R. Lister, M.R.C.S. Access — Terrington station, 1½ miles.

Leicester.—*Melbourne House,* Prop., Mr. H. M. Riley. Med. Attendant, R. Sevestre, M.A., M.D., Camb. London Consultant, F. M. Pierce, M.D., 50, Gordon Square, W. Nat. Tel., 362 Y Leicester. Station, 2 miles. *See also p.* 834

Newmains (N.B.).—*Newmains Retreat.* Licensed under Inebriates Acts. Access—Hartwood station, Cal. Railway. *See also p.* 834

Reigate (Surrey.) — *Duxhurst.* Supt., Sister in charge. Med. Supt., A. Walters., M.R.C.S. Access—Reigate, 4 miles.

Sidlow Manor, near Reigate. Apply to the Sister Supt.

See also p. 836

Spelthorne St. Mary (Bedfont, Middlesex). — Apply to Sister Superior, C.S.M.V. Access—Feltham, S.W.R., 1 mile.

Licensed under Inebriates Acts. Females—Primarily Gentlewomen and Middle Class (24). Treatment—Physical, Moral, and Spiritual.

Torquay.† — *Temple Lodge.* Res. Supt., Sister in Charge. Med. Off., W. Odell, M.D., F.R.C.S. Hon. Sec., Mrs. H. H. Erskine.

Wandsworth. — *Northlands Retreat,* 20, Bolingbroke Grove, Wandsworth Common, S.W. Lics., Dr. J. Round and the Misses Round. Access—Wandsworth Common.

MALE AND FEMALE.

Bristol. — *Brentry,* Westbury-on-Trym, for cases arising under the Licensing Act, 1902. Res. Supt. and Med. Off., Dr.. Fleck Hon. Sec., Rev. H. N. Burden. Access—Clifton Down station, 3½ miles.

Twickenham. — *High Shot House Dadson Nursing Home.* Med. Supts., M. H. Gardiner, M.B., and E. Le F. Payne, M.R.C.S. Apply direct, or to office of Dadson Nursing Homes, 14, Hills Place, Oxford St., W. Access—St. Margaret's station from Waterloo, 300 yards; Richmond, 1½ miles.

Average period of residence — four weeks. Ladies and gentlemen can be attended by their own medical men.

See also p. 832

REFORMATORIES CERTIFIED UNDER THE INEBRIATES ACT, 1898.

MALE AND FEMALE.

Bristol.—*Brentry certified Inebriate Reformatory,* Westbury-on-Trym. Res. Supt. and Med. Officer, Dr. D. Fleck. Hon. Sec., Rev. H. N. Burden. Access—Clifton Down, Redland, or Patchway station, 3½ miles.

Cattal (Yorkshire).—*Yorkshire Inebriate Reformatory,* Cattal, near York. For Yorkshire cases. Res. Supt. and Med. Off., Dr. F. P. Hearder. Access—Cattal, 1 mile.

FEMALES ONLY.

Ackworth (Yorkshire).—*North Midlands Inebriate Reformatory.* Res. Supt., the Officer in Charge. Med. Off., Dr. R. H. Rigby. Access — Ackworth station, 1½ miles.

Bristol.—*Royal Victoria Home,* Horfield. Med. Off., Dr. W. Cotton. Hon. Sec, Rev. H. N. Burden. Access—Montpelier and Bristol stations.

Chesterfield (Derbyshire).—*Midland Counties Inebriate Reformatory*, Whittington. Med. Off., Dr. A. M. Palmer. Access—Whittington station, ½ mile; Chesterfield, 5 miles.

East Harling (Norfolk). — *Eastern Counties Inebriate Reformatory*, East Harling, near Thetford. Res. Med. Supt., L. O. Fuller, M.R.C.S. Access—Harling Road stat. 3½ mls.

Horley (Surrey).—*Farmfield*. For London cases, under Sec. II of the Act. Res. Supt., Miss Forsyth. Med. Off., Dr. C. F. Williamson. Access—Horley station, 2½ miles.

Langho (Lancashire). — *Lancashire Inebriate Reformatory*, Langho, near Blackburn. For Lancashire cases. Res. Supt. and Med. Off., Dr. F. A. Gill. Access—Langho station, 1½ miles.

Lewes (Sussex).—*Southern Counties Inebriate Reformatory*, St. Anns, Lewes. Res. Supt., the Officer in Charge. Med. Off., Dr. W. A. Dow. Access—Lewes station, 1 mile.

UNLICENSED HOMES.

Carnoustie (N.B.)—*The Lodge*. Apply to the Secretary.

Croydon.—*Woodside Court*, Lower Addiscombe Road, for both sexes. J. M. Hobson, M.D. Access—East Croydon, 12 minutes by tram.

Durham.—24, Allergate, for friendless and inebriate women; 4 - per week. Hon. Sec., Miss King. Med. Supt., Dr. Robson. Access—Durham, ½ mile.

Edinburgh.—*Queensberry Lodge*, for ladies. Supt., A. Miller. Med. Supt., Dr. William Russell. Access—Waverley station, ½ mile.
See also p. 836

Fifeshire.—*Navitie Home*, Glencraig, for women. Hon. Sec., Mrs. Lockhart, 9, Royal Terrace, Edinburgh. Access—Blairadam, or Kinross, 4 miles on main line to to Perth. *See also p.* 831

Hounslow (Middlesex).—*West Holme*, for ladies. Supt., Matron in Charge. Med. Supt., Dr G. A. S. Gordon. Access—Hounslow ¾; Dist. Rly., ¼ mile.

Huddersfield (Yorks).—*High Flatts Sanatorium*, for ladies. Matron, Miss A. Jones. Access—Denby Dale, 1½ miles.

Leicester.—*Tower House*, for ladies. Prop., Mrs. Mills. Med. Attendant, A. V. Clarke, M.D. Access—Leicester station, 1¼ miles.
See also p. 833

Liverpool.—*Temperance Home*, 318, Upper Parliament Street, for women. Supt., Miss A. J. Wilson. Med. Officer, C. E. Soloman, M.D.

London.—*Norwood Sanatorium*, 93, Church Rd., Upper Norwood, S.E. Med. Supt., F. Hare, M.D. Access—Crystal Palace station, 10 mins.
See also p. 836

Maldon, (Essex).—*Osea Island Sanatorium*, for ladies and gentlemen. Res. Med. Supt., Dr. H. A. Reed. Prop., F. N. Charrington, Esq. Access—Maldon East station.

Norwich. — *Dadson Nursing Home*. Philanthropic home for working class men and women. Apply to office of Dadson Nursing Homes, 14, Hills Place, Oxford Street, W. Med. Supt., Dr. J. M. G. Bremner.

Average period of residence — four weeks. *See also p.* 832

HYDROPATHIC ESTABLISHMENTS.

We wish to make this list complete, but it is impossible when some Proprietors do not return our letter of enquiry, which is *stamped for reply*. This will account for some omissions in the present edition.

Aberdeen. — *Deeside Hydropathic*, Murtle, near Aberdeen. Res. Med. Supt., Alexander Stewart, M.D., LL.D., F.S.Sc. Access—Rail to Aberdeen, thence to Murtle station on the Deeside line, 5 miles from Aberdeen; from this station, 8 minutes. *See also p.* 852

Baslow.—*Grand Hotel and Hydro.* Access—Bakewell station, 4 miles by 'bus.

Bath.—*Lansdown Hospital and Nursing Home*, Bath (invalids only; special arrangements for patients suffering from gout, rheumatism, and physical infirmities). Med. Supts., Dr. Percy Wilde, and Dr. Wells-Beville. Access—M.R. or G.W.R. station, Bath, about 1 mile.

See also p. 823

Ben Rhydding.—*Ben Rhydding Hydro.* Phys., Thos. Scott, M.D., and Dr. W. R. Bates. Access—Station, a few hundred yards.

See also p. 854

Bexhill-on-Sea.—*Wilton Court Hotel and Hydro.* Manageress, Mrs. W. Purrott.

Bishops-Teignton (nr. Teignmouth).—*The South Devon Hydro & Health Resort.* Prop., C. F. Carpenter. Med. Supt., Arthur E. Hayward, M.R.C.S. Access — Teignmouth, 2½ miles.

Blackpool.—*Matlock Hydro & Boarding House*, Station Road. Access—3 minutes' walk from South Shore station.

Bournemouth (Hampshire).—*Bournemouth Hydropathic.* Res. Phys., W. J. Smyth, M.D. Access—East station, 1½ mile; West station, ½ mile.

Linden Hall Hydropathic. Man. Director, J. T. Exton. Telephone No. 705, Telegrams: "Exton, Bournemouth." *See also p.* 845

Bridge of Allan.—*Bridge of Allan Hydropathic Co.* Manageress, Miss McNeill. Vis. Phys., Dr. Haldane. Access—Station, ¼ mile.

Bristol. — *The Bristol Hydropathic* (formerly Bartholomew's Turkish Baths), College Green. Res. Phys., W. J. Spoor, M.B., M.R.C.S.

Bute.—*Kyles of Bute Hydropathic*, Port Bannantyne, Rothesay. Man., A. Menzies. Med. Supt., Dr. A. J. Hall. Access—Clyde steamers call daily.

Buxton.—*Buxton Hydro.* Manager, G. W. Bosworth. Access—Station, 4 minutes.

Corber Hill Hydro, Clarendon House. Man., Miss L. Adams. Access—Buxton station, 5 minutes.

Haddon Hall Hydro. Prop., Mrs. G. E. Hall.

The Peak Hydro. Man., Miss Withers. Med. Supt., Dr. Braithwaite. Access—Buxton station.

Callander, N.B.—*Callander and Trossachs Hydro.* Apply, Proprs.

Caterham (Surrey). — *Surrey Hills Hydropathic.* Res. Med. Supt., A. B. Olsen, M.D.

Clifton (near Bristol).—*Clifton Grand Spa and Hydropathic.* Access—Clifton Down station, 1 mile; Bristol station, 1½ miles.

Cork.—*St. Ann's Hill Hydropathic.* Res. Phys., M. Orb, M.D. Access—Blarney station, 2½ miles; Muskerry Light Railway from Cork, station on grounds.

Crieff.—*Strathearn House* (17 miles from Perth). Res. Med. Supts., Thos. H. Meikle, M.D., J.P., and T. Gordon Meikle, M.B., C.M. Access—Crieff station, 1 mile.

Dunblane.—*Philp's Dunblane Hydropathic*, Perthshire. Res. Phys., Dr. S. M. Sloan. Access—Dunblane station, ¾ mile. *See also p.* 848

Eastbourne.—*Eastbourne Hydropathic.* Man., W. J. Grimes.

Edinburgh.—*Hydropathic*, Slateford. J. Bell, Man. Dir. Access—Merchiston, 1 mile; Waverley, 3 miles.

Forres.—*Cluny Hill Hydropathic.* Vis. Phys., Dr. John Adam. Access—Forres station, 1 mile; Inverness, 24 miles.

Grange-over-Sands. — *Hazelwood Hydropathic.* Physicians, Richard Lowther, M.D., and Owen Gwatkin, M.R.C.S. Access—Carnforth, L. & N.W.R., and thence by Furness Railway; Grange-over-Sands, ¼ mile.

Harrogate (Yorkshire).—*The Cairn Hydropathic.* Near Leeds and Bradford. Man., Mrs. Baker. Access—Harrogate station, ½ mile. 5 minutes from Royal Baths and Pump Room. *See also p.* 847

The Harlow Manor Hydro. Man., Miss Oakley. Med. Supt., Dr. Dimmock.

The Harrogate Hydropathic. Phys., Drs. T. Johnstone and R. McLeod Veitch. Access—Harrogate station, ½ mile.

Hexham (Northumberland).—*Tynedale Hydropathic.* Prop., F. G. Grant. Med. Supt., Dr. Stewart. Access—Hexham, 1 mile; Newcastle, 19 miles.

Ilfracombe.—*The Cliffe Hydro.* Med. Supt., Chas. Toller, M.D. Apply to the Secretary. Station, 1 mile.

Ilkley (Yorkshire). — *Craiglands Hydro., Lim.* Res. Med. Supt., Henry Dobson, M.D., C.M.

Ilkley Wells Hydro. Manageress, Miss Fender. Access — Ilkley station, ¼ mile.

The Spa Hydropathic, near Leeds and Bradford. Manageress, Miss Pugsley. Med. Supt., T. Johnstone, M.D. Access—Ilkley, 3 mins.

Troutbeck Hydro. Manageress, Miss Moorhouse.

Isle of Man. — *Ramsey Hydro.,* Ramsey (about 16 miles from Douglas). Med. Supt., Dr. H. C. Sugden. Access—Ramsey, 10 minutes.

Kilmacolm (Renfrewshire).—*Hydropathic.* Access—Greenock, 7 miles; Glasgow, 16 miles, G. & S.W.R.

Leicester. — *The Sanitarium,* 82, Regent Road. Med. Supt., A. B. Olsen, M.D.

Limpley Stoke (near Bath).—*West of England Hydropathic.* Res. Med. Supt., Cerard Carré, M.D. Access—Limpley Stoke station.

Lincoln.—*Northcote Hydro.,* Woodhall Spa. Med. Supt., R. Cuffe, M.R.C.S.

Llandudno.—*Hydropathic and Winter Residence.* Med. Supt., James Craig, M.B. Access—Llandudno station, 5 minutes.

Malvern.—*The Malvern Hydropathic.* Res. Prop., Dr. J. N. F. Fergusson. Access—Great Malvern station, ¼ mile. *See also p.* 850

Wyche-side Hydropathic. Res. Phys., Dr. Grindrod. Access—Malvern Wells station, G.W.R., ½ mile; Great Malvern station, 2 miles.

Matlock. — *Matlock House Hydropathic,* Matlock. Physician, W. Moxon, M.D., J.P. Access—Matlock, M.R., ¼ mile.

Rockside Hydropathic, Matlock. Med. Supts., Drs. A. L'Estrange Orme and Marie Goodwin. Access—Matlock, ¾ mile. *See also p.* 853

Royal Hotel and Baths, Matlock Bath, connected with the Natural Thermal Mineral Spring. Phys., W. C. Sharpe, M.D. Access—Matlock Bath station. *See also p.* 852

Smedley's Hydropathic, Matlock. Res. and Vis. Physicians. Access—Matlock station, ½ mile; omnibus. *See also p.* 851

Melrose. — *Waverley Hydropathic.* Con. Phys., Drs. Calvert and Wade. Access—Melrose station, 1 mile.

Moffat.—*The Moffat Hydropathic.* Man., Miss Gardner. Med. Supt., Dr. Huskie. Access—Moffat station, 1 mile.

Peebles.—*Peebles Hotel Hydropathic.* Complete modern equipment of baths and electrical treatment. Plombières treatment for mucous colitis, and Bourbon Lancy treatment for heart disease. Fango di Battaglia (Mud packs for sciatica, etc.) Res. Phys., Thomas D. Luke, M.D., F.R.C.S.Edin. *See also p.* 849

Rostrevor (Co. Down). — *Rostrevor Hills Hydropathic.* Res. Med. Supt., Horace J. Williams, M.D. Access—Warrenpoint station, 2½ miles. *See also p.* 850

Rothesay. — *Glenburn Hydropathic.* Med. Supt., Dr. Marshall. Access—Wemyss Bay, ½ hour's sail. *See also p.* 848

Scarborough.—*Hydro.* Access—Scarborough, N.E.R., ¼ hour.

Shandon. — *Shandon Hydropathic.* Consulting Phys., Dr. Douglas Reid and Dr. Wm. R. Sewell. Access—Shandon station, 5 mins.

Skelmorlie. — *Wemyss Bay Hydropathic.* Med. Supt., Dr. W. C. Philp. Access—Wemyss Bay station, ½ mile. *See also p.* 854

Southport (Birkdale Park).—*Smedley Hydropathic.* Phys., J. G. G. Corkhill, M.D. Southport or Birkdale stations. *See also p.* 854

Sunnyside Hydropathic Compy. Man., J. Marshall. Access—Southport stations, ½ mile.

The Limes Hydropathic, 51, Bath Street. Phys., Dr. Kenworthy. Access—Chapel Street (L. & Y.), Lord St. (Cheshire Lines) ¼ mile.

Tunbridge Wells.—*The Spa Hotel.* Access—Station, about 1 mile; London, 34 miles. Prop., H. R. Willats.

Ulverston.—*Conishead Priory Hydropathic.* Med. Supt., Dr. Ashburner. Access—Ulverston station, 1¾ mls.

Watford.—*The Hall,* Bushey. Man., Col. Coyne. Med. Supt., Dr. F. Smith. Access—L. & N.W., 1 mile.

Windermere. — *Windermere Hydropathic.* Access—Windermere, L. & N.W.R. 1 mile. Sec., W. Martindale.

NURSING INSTITUTIONS AND PRIVATE HOMES FOR INVALIDS.

NURSING INSTITUTIONS.

Bath.—*Lansdown Hospital Nursing Home and Private Nursing Institute,* Lansdown, apply the Matron.
See also p. 823

Bournemouth.—*Victoria Nurses' Institute and Home Hospital,* Cambridge Road. Matron, C. Forrest. Access—Bournemouth West stat.
See also p. 824

Bristol.—*General Hospital.* Matron, Miss A. J. Angus. Sec., Wm. Thwaites. *See also p.* 820

Cheltenham. — *General Hospital* Private Nursing Staff. Matron Miss G. Möller. *See also p.* 821

Devonport.—*Royal Albert Hospital Nursing Inst.* Matron, Miss E. G. Woodward.

Fee charged, per week: Ordinary cases, £1 11s. 6d.; Infectious, Operation and Hysterical, £2 2s.; Small Pox £3 3s.; Massage, £2 2s., or 5s. per visit. Travelling expenses and laundry extra.

London.—*Baker Street Association of Hospital-Trained Nurses,* 15, Baker Street, W. Supt., Miss Masters.
See also p. 821

Hooper's (Miss) Trained Nurses' Institute, 9, Upper Baker St., W. Also at 35, Holmdale Road, West Hampstead, N.W. *See also p.* 821

Male Nurses' Association, 23, York Place, Baker St., W. Supt., Wm. Gutteridge. *See also p.* 820

St. Luke's Hospital, Old Street, E.C. Trained Nurses for Mental, Nervous and Massage Cases. Apply Matron. *See also p.* 822

Temperance Male Nurses' Co-operation, Ltd., 43, New Cavendish Street, W.; also at Manchester and Edinburgh. Secretary, M. D. Gold. *See also p.* xxix

Wigmore Nurses' Co-operation and Medical and Surgical Nursing Home, 59, Weymouth Street, W. Lady Supt., Mrs. Gibbins.
See also p. 821

Sunderland. — *Nursing Inst. and Home for Trained Nurses.* Matron, Miss C. Aldis.

Thoroughly reliable Nurses supplied for Medical, Surgical, Mental, and Maternity cases.

PRIVATE HOMES FOR INVALIDS.

Alderley Edge (Cheshire). — *The David Lewis Colony* (for Epileptics). Director, A. McDougall, M.D., Warford, near Alderley Edge. *See also p.* 819

Bournemouth. — *Victoria Nursing Institute and Home,* Cambridge Road (for paying patients). Apply the Matron. *See also p.* 824

Buxton. — *Corbar Tower,* Dietetic and Medical Home. Apply Mrs. Owen. Access—Station, Pump Room and Baths, 10 minutes' walk. *See also p.* 822

Chilcompton (near Bath).—*Downside Lodge* (for ladies of weak intellect). Lady Supt., Miss Page. Med. Supt., G. Pollard, M.D. Access—Chilcompton, about ¼ mile.

Chorley Wood (Herts.).—*The Laburnums,* Heronsgate. Private Home for epileptic, paralytic, and other cases. Apply, Miss King. Access—Chorley Wood station, 1½ miles.
See also p. 822

Crowborough Beacon (Sussex).—*Twyford House*. Nursing home, rest cure cases, chronic invalids, etc. Apply, Mrs. Dashwood.
See also p. 824

Eversley (Hants).—*Glencote* (Sanatorium for Non-tubercular cases). Res. Med. Supt., J. G. Garson, M.D. Access—Wellington College station, 4½ miles; Fleet, 6 miles.
See also p. 827

Hadlow Down, Buxted (Sussex).—*South Beacon* (for the care and treatment of gentlemen mentally affected, but not ill enough to be certified) Prop., Philip H. Harmer. Access—Buxted, 3 miles; Mayfield, 4 miles; Heathfield 4 miles.
See also p. 824

Haslemere, Surrey.—*Haslemere Nursing Home, "Courtsfold."* Medical, Weir-Mitchell, Rest Cure, and Chronic cases received. Apply to the Misses Ringwood and Inge. Tel. No. 22.
See also p. 825

Hounslow (near Isleworth).—*Gunnersbury House* (for invalid ladies irrespective of Creed). *See also p.* 819

Jedburgh.—*Abbey Green*. Res. Prop., Wm. Blair, M.D. Access—N.B.R., Jedburgh. Tel. No. 3. *See also p.* 826

Jersey.—*Pinehurst Nursing Home*. Med. Supt., Dr. Symons, Beaumont, Jersey. Secretary, Miss Oxenden.

For any kind of delicacy, or first stages of threatened phthisis.

London.—*St. Thomas's Home*, St. Thomas's Hospital, Westminster Bridge. Apply, Sydney Phillips, B.A., St. Thomas's Hospital, S.E. Access — Waterloo, 5 minutes. Tel.: Hop. 1637. *See also p.* 823

Ryde (Isle of Wight). — *Crescent House* (for treatment of paralysis, neurasthenia, osteo-arthritis and deafness. Apply, Dr. G. M. Lowe.
See also p. 825

Stanmore (Middlesex).—SCARLET FEVER *Convalescent Home* (*The Mary Wardell*). Vis. Phys., A. Muir, M.D. Hon. Sec., Miss M. Wardell. Access — Stanmore, 2 miles. *See also p.* 823

Wallingford (Berks).—*Hailey House*, Ipsden, Oxon. Neurasthenia, dyspepsia, nervous debility, insomnia, etc. Res. Phys., F. S. Arnold, M.B. Access — Goring station, G.W.R., 4¾ miles, or Wallingford, 4 miles. *See also p.* 825

PRINCIPAL BRITISH SPAS.

WITH INDICATIONS FOR THEIR THERAPEUTICAL EMPLOYMENT.

Bath (Somersetshire).—Sheltered from the N. and N.E. winds by a range of hills from 600 to 800 feet high; 2 hours from London (Paddington), 12 miles from Bristol. Average rainfall 30·79 inches. Climate mild and equable.

Waters.—Three thermal springs, known respectively as "The Hot Spring or Old Royal," 120° F.; "The King's Bath Spring," 114° F., used for drinking purposes, and "The Cross Bath Spring." The waters contain sulphates of calcium, strontium, sodium, and potassium, with calcium carbonate, the chlorides of magnesium, sodium, and lithium, etc.

Therapeutic indications.—Gout, chronic rheumatism, rheumatoid arthritis, sciatica, disorders of the digestive organs, anæmia, skin diseases, nervous disorders and debility.

Baths.—Modern baths of every description, including Aix massage douche, electric, water and hot air, natural vapour, needle, sulphur, and swimming. *See also p.* 845.

Bridge of Allan (Stirlingshire).—Three miles north of Stirling. Sheltered from the North and East winds by the Ochil Hills. On the direct route to London, and within an hour's rail journey of Edinburgh and Glasgow. Climate mild and equable.

Waters.—Natural mineral waters from six springs at a depth of about 116 feet, exceedingly rich in saline, the chief ingredients being various salts of calcium, sodium, and magnesium.

Therapeutic Indications.—Chronic affections of the liver, stomach, and bowels, in many chest diseases, and in rheumatism, gout, sciatica, and other nerve affections, also diseases of the skin.

Hotel.—Philp's Royal Hotel (*See p.* 850).

Buxton (Derbyshire).—1000 feet above sea level, 3½ hours from London (St. Pancras), 23 miles from Manchester, 30 from Sheffield, 53 from Liverpool. Bracing climate. Lowest absolute humidity of any health resort in Great Britain.

Waters.—Thermal springs 82° F. Powerful radio-active properties. More highly charged with nitrogen gas than any other spring. Chalybeate spring.

Therapeutic indications.—Gout, rheumatism, rheumatoid arthritis, sciatica, nervous diseases, skin diseases, especially those of gouty origin, malaria and other tropical diseases, colitis, anæmia, and diseases of women.

Baths.—Recently extended. Immersion, douche, vapour, douche-massage. Complete electrical department. Moor baths. Plombières douches. Chalybeate baths, and carbonic acid gas baths.

Cheltenham (Gloucestershire).—250 feet above sea level, 3 hours from London. Rainfall about 27 inches. Protected from N. and N.E. winds.

Waters.—The mineral waters are of two kinds. One is alkaline from contained soda carbonate, the other is impregnated with the sulphates of soda and magnesia. They are now receiving considerable attention from the medical profession, and seem likely to successfully compete with Carlsbad and Marienbad in attracting a portion of the patients formerly sent abroad.

Therapeutic indications.—Gout, dyspepsia, dietetic disorders generally, neurasthenia, and other conditions.

Baths.—Good modern baths, with massage; Aix-douche, brine, etc.

Hotel.—The Queen's Hotel (*See p.* 840).

Droitwich (Worcestershire.)—150 feet above sea level, 2½ hours from London (Paddington), 19 miles from Birmingham, 6 from Worcester. Rainfall 23 inches. Mean winter temperature 47° F., summer 69·9° F. Well protected from N. and N.E. winds.

Waters.—The most powerful saline in the world. The brine is pumped from 200 feet below the ground level. Temperature 54° F., and is heated by introducing steam. It is 10 to 12 times as strong as that of the ocean (channel), containing in every gallon 20,000 grains of saline in excess of any known waters: the waters possess radio-active properties.

Therapeutic indications.—Chronic muscular and articular rheumatism, rheumatoid arthritis, chronic articular or irregular gout, neuritis, neuralgia, heart diseases, especially those of myocardium—effect similar to Nauheim treatment,—neurasthenia, anæmia, chlorosis, some sclerotic diseases of spinal cord, skin diseases of a dry, scaly nature, e.g., chronic eczema and psoriasis.

Baths.—Immersion, douche, needle, vapour, and swimming; and to be completed early in the present year, Aix-douche, Nauheim baths, etc.

Hotel.—Worcestershire Brine Baths Hotel, and Brine Baths (*See p.* 844).

Harrogate (Yorkshire).—450 feet above sea level, 4 hours from London, 17 miles from Leeds, 20 from York. The climate is stimulating and fairly dry—bracing moorland air.

Waters.—Celebrated for the medicinal properties of its 80 springs—sulphurous, chalybeate, saline, etc.

Therapeutic indications.—Anæmia, chlorosis, gout, rheumatism, disorders of liver and stomach, muco-membranous colitis, chronic appendicitis, and skin diseases.

Baths.—There are four establishments for treatment, the chief being the Royal Baths, where 50 different treatments are given, including sulphur baths, douche, Nauheim, vapour, Russian, Turkish, electric, mineral, electric light, ozone, etc. *See also p.* 846

Hydropathic Establishment.—The Cairn Hydropathic (*See p.* 847).

Ilkley (Yorkshire).—Situated on the southern slope of the valley of the Wharfe, rising rapidly from the bank of the river to a height of 750 feet above sea level; distant 16 miles from Leeds, 14 from Bradford, and 18 from Harrogate. Occupying a sheltered position. The annual rainfall, 35 inches, is considerably less than on the other side of the river, with fewer rainy days. Mean annual temperature 48° F. Being in close proximity to extensive moors the air is bracing and exhilarating and at the same time dry and soft, having a wonderfully restorative effect upon invalids.

Waters.—The water supply obtained from springs is remarkably pure, bright and sparkling, and does not act on lead. Chalybeate waters.

Therapeutic indications.—Gout, rheumatism, neuritis, neurasthenia, anæmia, asthma, and bronchitis cases are benefited. The treatment adopted is that known as hydro-therapeutic.

Baths.—Complete suites of baths are to be found in the numerous establishments, and at Ben Rhydding there is in addition an electric installation comprising static electricity, high frequency, X rays, radiant light, and vibratory massage.

Hydropathic Establishment.—Ben Rhydding Hydropathic (*See p.* 854).

Leamington Spa (Warwickshire).—170 feet above sea level, 1 hour 50 minutes from London (Paddington or Euston), 24 miles from Birmingham. Equable and mild climate.

Waters.—Saline—chalybeate. Resembling those of Homburg, but are more generally useful.

Therapeutic indications.—Muscular and articular rheumatism, gout, rheumatoid arthritis, neuralgia and neuritis, diseases arising from a plethoric condition of the chylopoietic viscera, eczema and other irritative disorders of the skin, conditions of increased vascular tension and chronic interstitial nephritis.

Baths.—Turkish, medicated, swimming, and electric of all kinds.

Llandrindod Wells (Radnorshire). — Situated in Central Wales, at an altitude of 750 feet. About 6 hours from London on the L. & N.W. Ry. It lies in the centre of a plateau of hills rising in places to over 2000 feet. Sheltered from the east, and open to the south and west. The soil is porous, and dries up quickly after rain. The climate is extremely bracing.

Waters.—There are a great variety of mineral waters—sodium chloride, sulphur, iron, magnesium, chloride of calcium, and lithia springs similar in composition to those at Kissengen, Homburg, and Contrexéville. Slightly aperient and strongly diuretic.

Therapeutic indications.—The diseases most benefited are those in which any digestive derangements are present, the various forms of gout and rheumatism, rheumatoid arthritis, neuritis and fibrositis, gall-stones and biliary stasis, renal calculus, or any kidney or bladder condition requiring diuresis, neurasthenia, or debility from over-work or convalescence.

Llangammarch Wells (Breconshire).—In an open valley surrounded by moorland, 600 feet above sea level. On the L. and N.W.Ry., 5¾ hours from London, 4 from Manchester, 4¼ from Liverpool. Mean annual temperature 47·5° F., summer 55·4° F. Well protected from the east.

Water.—Saline, containing the chlorides of barium, calcium, magnesium, lithium, and sodium; the only one of its kind in the British Isles. The barium salt has a physiological action on cardiac muscle similar to that of digitalis and strophanthus, and is also a good diuretic. Administered both internally and externally. Temperature 56° F.; is heated for bathing purposes. A modified Nauheim system of baths, exercises, massage, and hill climbing is carried out.

Therapeutic indications.—Cardiac diseases, organic and inorganic, especially affections of the myocardium due to influenza. Graves' disease, chronic muscular and articular rheumatism, osteo-arthritis, gout, sciatica, and neurasthenia.

Baths.—Immersion, douche, and needle.

Hotel.—Lake Hotel and Bungalow Private Hotel (*See p.* 897).

Malvern (Worcestershire).—Situated at a mean altitude of 500 ft. above sea level, on eastern slope of Malvern Hills (9 miles long and rising to 1400 ft.), 2¾ hours from London (Paddington), and about 1 hour from Birmingham. Original home of hydropathy. Soil gravelly (syenitic detritus). Air dry and bracing, cool in summer and warm in winter. Mean annual temperature 49·58, with low daily variation. Lowest death rate of any inland watering place. Sanitation perfect.

Waters.—Mainly spring, of remarkable purity, free from organic matter, less than 4 grains of earthy salts per gallon.

Therapeutic Indications.—Gout, rheumatism, neuralgia, sciatica, lumbago, dyspepsia, constipation, anæmia, bronchial, nephritic and cutaneous diseases.

Hydropathic Establishment.—Dr. Fergusson's Hydropathic (*See p.* 850).

Hotel.—Belle Vue Hotel (*See p.* 850).

Matlock Bath (Derbyshire).—300 to 800 ft. above sea level, 3½ hours from London (St. Pancras), 46 miles from Manchester, 16 from Derby. Rainfall 29 inches. One of the most sheltered towns in England.

Waters.—Thermal Springs. Mild sulphated alkaline—saline waters at 68° F., containing 33 grains per gallon of salts, mainly magnesium and calcium bicarbonate, and magnesium sulphate. Owing to its peculiarly soft and unctuous character it is especially valuable in bathing and douche operations, particularly those associated with massage, such as those known as the "Aix" and "Vichy" douches.

Therapeutic indications.—Rheumatism, gout, rheumatoid arthritis, neuritis, neurasthenia, catarrhs (bronchial, gastric, or enteric), anæmia, cardiac asthenia, chronic diseases of the liver or kidneys, and digestive and bilious disorders.

Baths, etc.—A complete modern installation exists for the administration of all kinds of baths, douches, packs, and other hydropathic treatment, electricity, massage, inhalations, Nauheim baths, with Swedish exercises.

Fango-di-Battaglia.—The volcanic mineral deposit from the hot springs near Padua (N. Italy) is imported, and extensively used in the treatment of gout, rheumatoid arthritis, and neuritis.

Hydropathic Establishment.—The Royal Hotel and Baths (*See p.* 852).

Matlock Bank (*Matlock* station, one mile by rail from Matlock Bath).—300 to 800 feet above sea level, 3½ hours from London (St. Pancras), 45 miles from Manchester, 17 from Derby. South-westerly aspect, and well sheltered from the north. Climate mildly bracing. Sunshine above the average. The Matlock system of hydropathic treatment is carried out in all its branches, and the principal Hydros are installed with latest electric baths and appliances, including high-frequency, Dowsing radiant light and heat, Schnee four-cell, X rays, etc. They also include Turkish, Russian, plunge, medicated and inhalation baths, Aix and Vichy douches, etc.

A feature of the Matlock Hydros is, that as a rule they are complete in their own grounds, and contain croquet and tennis lawns, and bowling and putting greens, which, as a means of recreation and exercise, form a valuable auxiliary to a course of hydropathic treatment.

Hydropathic Establishments.—Rockside Hydropathic (*See p.* 853), and Smedley's Hydropathic (*See p.* 851).

Peebles (Peebleshire, N.B.).—500 ft. above sea level. One hour from Edinburgh and 8 from London (via Galashiels). Rainfall 27 inches. Bracing climate but sheltered from the north winds. Mean annual mortality rate 11 per mil. Population 6000 in winter, and 10,000 in summer.

Waters.—The waters are of the halothermal type, similar to Kissengen and Kreuznach. The chief ingredient is chloride of sodium. They are obtained from the famous St. Ronans Well.

Therapeutic indications.—The waters are specially suited to the Nauheim and Bourbon Lancy treatment of cardiac disease, and in this respect seem likely to compete with the above mentioned continental resorts, patients being saved the long journey, and also, after the baths, are conveyed by lift immediately to their rooms for resting. The waters are also suited to dyspepsia, gout, rheumatism and neurasthenia.

Baths.—The baths at the hydropathic are of the most modern type. Complete electrical installation and mud baths (Fango di Battaglia).

Hydropathic Establishment.—Peebles Hotel Hydropathic (*see p.* 849).

Strathpeffer Spa (Ross-shire).—In the Highlands of Scotland. 180 to 300 feet above sea level. Through carriages twice a week during summer from London, 15 hours, and per the Highland Railway (*see p.* 840). Sheltered from N. and N.E. winds. Prevailing wind S.W. Sandy soil. Bracing air.

Waters.—Sulphurous and chalybeate. Former, very rich in sulphuretted hydrogen gas and sulphates. Four sulphur wells in use: (1) Old well; (2) Upper; (3) Strong; (4) Cromartie. No. 4 contains over 19 cubic inches H_2S to gallon. Sulphates the predominating salt. Have strong diuretic and mild aperient action.

Therapeutic indications.—Chronic and subacute gout and rheumatism (especially articular), rheumatoid arthritis, chronic skin diseases (eczema, acne, psoriasis, etc.), especially when gouty or rheumatic, chronic disorders of the digestive system, chronic gastric or intestinal catarrh, sluggish portal circulation, congested liver, biliary and urinary calculi, neurasthenia, anæmia, obesity, chronic metallic poisoning, dilatation of heart, neuritis.

Baths.—Sulphurous (immersion), inhalation, peat, douche (Aix and Vichy), needle, pine, Russian, Nauheim, radiant heat (electric), and high-frequency current.

Hotel.—The Ben Wyvis Hotel (*see p.* 841).

Tunbridge Wells (Kent).—400 feet above sea level, 1 hour from London, 30 miles from Hastings, Brighton, and Eastbourne. Rainfall 30 inches. Mean winter temperature 41·3° F., summer 55·9° F. Lies upon a bed of sandstone. Climate is mildly tonic and invigorating. Prevailing winds W. and S.W.

Waters.—Chalybeate spring, containing 4 grains ferrous carbonate to the gallon, with sulphates and chlorides of potash, soda, and calcium.

Therapeutic indications.—Diseases of respiratory organs (bronchitis, asthma, and phthisis), early cardiac cases, diseases of digestive organs, gout and rheumatoid arthritis, and especially diseases of nervous system (neurasthenia and mental depression), as well as in convalescence and infantile disorders. Waters indicated in anæmia, chlorosis, and allied conditions.

Baths.—Immersion, douche, needle, vapour and swimming, medicated and electric light.

Woodhall Spa (Lincolnshire).—Built upon ironstone sand, through which the surface water percolates very rapidly. Midway between Boston and Lincoln, about 3 hours from London (King's Cross). Rainfall 22·66 inches. Air bracing, clear, and uncontaminated, from the moors and pine woods. Excellent water supply.

Waters.—Bromo-iodine waters, rich in the chlorides of sodium, calcium, and magnesium, with bromine and iodine.

Therapeutic indications.—Chronic articular and muscular rheumatism, gout, sciatica, and lumbago; neuritis, skin diseases, tuberculous diseases, gall-stones, and liver derangements, and diseases peculiar to women.

Baths.—Complete and recently enlarged immersion, shower, lave, and local douches; inhalation, respiration, natural vapour, Russian and Berthollet vapour; Dowsing radiant heat, and light treatment, Nauheim, Aix and Vichy massage douche, electric treatment, and X rays.

Hotel.—Victoria Hotel. *See also p.* 846.

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Anatomy, Inspectors of—
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EDUCATIONAL VACCINATION STATIONS.

In order to provide for the granting of those Special Certificates of Proficiency in Vaccination which are required to be part of the Medical Qualification for entering into contracts for the performance of Public Vaccination, or for acting as deputy to a Contractor, the following arrangements are made :—

(1) The Vaccination Stations enumerated in the subjoined list are open, under certain specified conditions, for the purposes of Teaching and Examination ;

(2) The Vaccinators officiating at these Stations are authorized to give the required Certificates of Proficiency in Vaccination to persons whom they have sufficiently instructed therein ; and

(3) The Vaccinators whose names in the subjoined list are printed in *italic letters* are also authorized to give such Certificates, after satisfactory examination, to persons whom they have not themselves instructed.

Cities and Towns having Educational Vaccination Stations.	Places used as Educational Vaccination Stations.	Vaccinators authorized to give Certificates of Proficiency in Vaccination.	Days and Hours of Attendance of the Vaccinators at Stations where periodic Courses of Instruction are given (*a*).
London ..	Westminster Hospital	A. E. Cope, M.D., [S.W. 26, Bessborough Gardens,	Thursday ; 11
	St. Thomas's Hospital		Tuesday ; 10.30
	Tolmers Square Institute, Drummond St., N.W.	*J. Loane, M.R.C.P.*, 13, Great Alie Street, E.	Monday, Wed. ; 1
	Eastern Disp., Leman St.		Wednesday ; 11
	Christ Church Mission Hall, Shroton St., Marylebone	E. C. Greenwood, L.R.C.P., 19, St. John's Wood Park, N.W.	Friday ; 3
	St. Olave's and St. John's Institute, Tooley St., S.E.	V. A. Jaynes, M.R.C.S., .. 157, Jamaica Road, Bermondsey, S.E.	Wednesday ; 3
	New Hospital for Women, 144, Euston Road, N.W.	Miss M. Thorne, M.D., .. 148, Harley Street, W.	Friday ; 9
Birmingham ..	Priory Rooms, Upp. Priory	W. H. Line, M.D., ... 144, Hockley Hill	
Bristol ..	St. Peter's Hospital, Bristol	*G. S. Page, L.R.C.P.*, .. 78, Old Market Street	Wednesday ; 11
Cambridge ..	Addenbrooke's Hospital ..	Dr. F. Deighton, ... Hills Road	Wednesday ; 4
Leeds ..	Leeds General Infirmary ..	Dr. A. T. Bacon, .. Westfield, Hyde Park Rd.	*
Liverpool ..	17, Mulgrave Street	*Dr. N. E. Roberts*, .. 17, Mulgrave Street	Tuesday ; 3
Manchester ..	St. Mary's Hosp., Whitworth Street West, Manchester	John Scott, M.D., .. 249, Upper Brook Street	*
Newcastle ..	The Dispensary, Nelson St.	*F. Hawthorn, M.D.*, .. 6, Regent Terrace	Wednesday ; 3
Sheffield ..	Jessop Hospital for Women	Dr. P. E. Barber, ... 3, Clarkehouse Road	*
Aberdeen ..	The Public Dispensary ..	Dr. T. Fraser, ... 51, Elmbank Terrace	Wednesday ; 2.30
Dundee ..	Royal Infirmary	R. C. Buist, M.D., ... 166, Nethergate	Monday ; 2
Edinburgh ..	New Town Dispensary Marshall Street Dispensary	*J. B. Buist, M.D.*, 1, Clifton Terrace	Thursday ; 11
	Livingstone Dispensary, 39, Cowgate		Tuesday ; 3
	St. Cuthbert's Hall, Freer Street, Fountainbridge		Thursday ; 3
	The Royal Public Dispensary	W. G. A. Robertson, M.D., 26, Minto Street	Wed. & Sat. ; 12
Glasgow ..	The Royal Infirmary	Dr. H. H. Borland, 571, Alexandra Parade, Denistown	Monday ; 12 (Women) Thursday ; 12 (Men)
	The Western Infirmary	Dr. J. W. Nicol, ... 7, Kersland Terrace	Mon. & Thurs. ; 12
Belfast ..	City of Belfast Union Infirm.	Dr. J. McLiesh, ... 91, Great Victoria Street	*
Cork ..	Cork District Hospital ..	W. E. A. Cummins, M.D., .. 17, St. Patrick's Place	*
Dublin ..	45, Upper Sackville Street ..	*Dr. A. N. Montgomery*, 45, Upper Sackville Street	Tuesday, Friday ; 10
Galway ..	The Dispensary	Dr. M. J. McDonogh, .. Flood Street	*

(*a.*) *Candidates for Certificates should communicate with the authorized Teacher to learn the dates of his or her regular courses of instruction.* * *Days and hours arranged each Session.*

MEDICAL AND SCIENTIFIC SOCIETIES.

Abernethian Society—St. Bartholomew's Hospital, E.C.
Æsculapian Society—Secretary, 346, Kingsland Road, N.E.
Anæsthetists, Society of—20, Hanover Square, W.
Anatomical Society of Great Britain and Ireland—Secretary, W. Wright, F.R.C.S., London Hospital.
Association for the Advancement of Medicine by Research—Secretary, 135, Harley Street, W.
Association of Physicians of Great Britain and Ireland—Secretary, 40, Wimpole Street, W.
Association of Registered Medical Women—Sec., 85, Crouch Hill, N.
British Association for the Advancement of Science—Burlington House, Piccadilly, W.
British Balneological and Climatological Society—Sec., 11, Cavendish Place, W.
British Dental Association—Secretary, 19, Hanover Square, W.
British Medical Association—429, Strand, W.C.
British Medical Benevolent Fund—Sec., St. Bartholomew's Hospital, E.C.
British Medical Temperance Association—Sec., 124, Harley Street, W.
British Orthopædic Society—Hon. Sec., 20, Bedford Square, W.C.
Chemical Society—Burlington House, Piccadilly, W.
Entomological Society of London—11, Chandos Street, W.
Epsom College (Royal Medical Foundation)—Sec., 37, Soho Square, W.
Geological Society of London—Burlington House, Piccadilly, W.
Harveian Society of London—Stafford Rooms, Tichborne Street, W.
Hunterian Society, The London Institution—Finsbury Circus, E.C.
Imperial Cancer Research Fund—Examination Hall, Victoria Embankment, W.C
Imperial Vaccination League—53, Berners Street, W.
Incorporated Medical Practitioners' Association—434, Strand, W.C.
Incorporated Society of Medical Officers of Health—1, Upper Montague Street, Russell Square, W.C.
King's College Medical Society—King's College Hospital, W.C.
Linnæan Society of London—Burlington House, Piccadilly, W.
Lister Institute of Preventive Medicine, Chelsea Bridge Road, S.W.
London Hospital Medical Society—Mile End, E.
Medical Defence Union, Lim.—4, Trafalgar Square, W.C.
Medical Officers of Schools Association—Secretary, 33, Harley Street, W.
Medical Society of London—11, Chandos Street, W.
Medico-Legal Society—22, Albemarle Street, W.
Medico-Psychological Association—Sec., 11, Chandos Street, W.
National Association for the Prevention of Consumption—20, Hanover Square, W.
New Sydenham Society—Secretary, 9, Wimpole Street, W.
Ophthalmological Society of the United Kingdom—11, Chandos Street, W.
Pathological Society of Great Britain and Ireland—Secretary, Guy's Hospital, London, S.E.
Pharmaceutical Society of Great Britain—17, Bloomsbury Square, W.C.
Physiological Society—Sec., C. S. Sherrington, M.D., Univ. Coll., Liverpool.
Poor Law Medical Officers' Association—Sec., 243, Hackney Road, N.E.
Psychical Research, Society for—20, Hanover Square, W.
Röntgen Society—Hon. Sec., F. H. Low, M.B., 2, Henrietta Street, W.
Royal Anthropological Institute of Great Britain & Ireland—3, Hanover Square, W.
Royal Astronomical Society—Burlington House, Piccadilly, W.
Royal Institute of Public Health—Russell Square, W.C.
Royal Institution of Great Britain—Albemarle Street, Piccadilly, W.
Royal Meteorological Society—70, Victoria Street, S.W.
Royal Microscopical Society—20, Hanover Square, W.

Royal Sanitary Institute of Great Britain, with which is incorporated the Parkes Museum—Margaret Street, Regent Street, W.
Royal Society of London—Burlington House, Piccadilly, W.
Royal Society of Medicine—Secs., 20, Hanover Square, W., incorporated by Royal Charter, 1907, and embracing the following Sections :—Anæsthetical —Children's Diseases—Clinical—Dermatological—Electro-Therapeutical —Epidemiological—Laryngological—Medical—Neurological—Obstetrical and Gynæcological—Odontological—Otological—Pathological—Surgical —Therapeutical and Pharmacological.
Royal Statistical Society—9, Adelphi Terrace, W.C.
Society for the Relief of Widows and Orphans of Medical Men—11, Chandos Street, W.
Society for the Study of Inebriety—Hon. Sec., T. N. Kelynack, M.D., 133, Harley Street, W.
Society of Members of the Royal College of Surgeons of England—Sec., W. G Dickinson, M.D., "Elmbank," West Hill, Putney, S.W.
Society of Tropical Medicine and Hygiene—Sec., 31, Cavendish Square, W
The Lancet Relief Fund—Secretary, *Lancet* Offices, 423, Strand, W.C.
Volunteer Medical Association—20, Hanover Square, W.
West London Medico-Chirurgical Society — West London Hospital, Hammersmith, W.
Zoological Society of London—3, Hanover Square, W.

MEDICAL AND SCIENTIFIC PERIODICALS, Etc.

Australasian Medical Gazette—Monthly 2/-—Baillière, 8, Henrietta Street, W.C.
Analyst—Monthly 2/-—Simpkin & Co., 2–8, Orange Street, Leicester Sq., W.C.
Anatomy and Physiology, Journal of—Quarterly, 21/- per annum. Chas. Griffin & Co., Lim., Exeter Street, W.C.
Annals of Surgery—Monthly 2/-—Cassell & Co., Lim., Ludgate Hill, E.C.
Balneology and Climatology, Journal of—Quarterly 2/-—Bale, Sons & Danielsson, Lim., 83–91, Great Titchfield Street, W.
Birmingham Medical Review—Monthly. 10 - per annum—Percival Jones, Lim., 148–149 Great Charles Street, Birmingham.
Botanical Gazette (12 numbers yearly)—28, Essex Street, Strand, W.C.
Botanical Magazine—Monthly, 3/6—6, Henrietta Street, W.C.
Botany, Journal of—Monthly, 1/8—54, Hatton Garden, W.C.
Brain—Quarterly 1/—Macmillan & Co., Lim., St. Martin's Street, W.C.
Bristol Medico-Chirurgical Journal — Quarterly 1/6 — J. W. Arrowsmith, Bristol; J. & A. Churchill, London
British and Colonial Druggist—Weekly, 5/- per annum—44, Bishopsgate Street Without, E.C.
British Homœopathic Society, Journal of—Quarterly, 2/6—Bale, Sons & Danielsson, Lim., 83–91, Great Titchfield Street, W.
British Homœopathic Review—Monthly 1/—83–91, Great Titchfield St., W.
British Medical Journal—Weekly 6d.—429, Strand, W.C.
British Sanatoria Annual—5/- yearly—Bale, Sons & Danielsson, Lim, 83–91, Great Titchfield Street, W.
Burdett's Hospitals and Charities—Annually 7/6—28-29, Southampton St., W.C.
Caledonian Medical Journal—Quarterly 1/—A. Macdougall, Mitchell Street, Glasgow
Chemical Industry, Journal of the Society of—Fortnightly, 36/- per annum — Westminster House, Great Smith Street, S.W.
Chemical Society, Journal of the—Monthly, 40/- per annum.—10, Paternoster Row, E.C.
Chemist and Druggist—Weekly 4d., 10/- per ann. —42, Cannon Street, E.C.
Children, Reports of the Society for the Study of Disease in—Yearly 12/6– J. & A. Churchill, 7, Great Marlborough Street, W.

Children's Diseases, British Journal of—Monthly 1/-—Adlard & Son, 22½, Bartholomew Close, E.C.
Clinical Journal—Weekly 3d.—22½, Bartholomew Close, E.C.
Dental Record—Monthly, 7/6 per annum—6-10, Lexington Street, W.
Dental Science, British Journal of—1st and 15th, 6d.—289, Regent St., W
Dental Surgeon—Weekly 3d., 13/- per annum—Baillière, 8, Henrietta Street, W.C.
Dental Surgeon's Daily Diary and Appointment Book—Yearly 7/-, or 8/6—83-91, Great Titchfield Street, W.
Dentistry, Australasian Journal of—Monthly 1/-—Baillière, 8, Henrietta Street, W.C.
Dentists' Register—Annually 3/4—5, New Street Square, E.C.
Dermatology, British Journal of—Monthly 2/-—H. K. Lewis, 136, Gower Street, W.C.
Dublin Journal of Medical Science—20/- per annum.—Fannin & Co., Limited, Dublin.
Edinburgh Medical Journal—Monthly 2/-—St. Giles Street, Edinburgh.
Entomologist—Monthly 6d.—54, Hatton Garden, E.C.
Entomologists' Monthly Magazine—Monthly 6d.—10, Paternoster Row, E.C.
Folia Therapeutica—Quarterly 1/-—83-91, Great Titchfield Street, W.
General Practitioner—Weekly 3d.—418-422, Strand, W.C.
Geological Magazine—Monthly 1/6—37, Soho Square, W.
Geologists' Association Journal—Bi-monthly 1/-—Geologists' Association, University College, London
Glasgow Medical Journal—Monthly 2/-—A. Macdougall, Mitchell St., Glasgow.
Good Health—Monthly 1d.—451, Holloway Road, N.
Guy's Hospital Gazette—Fortnightly 6d.—Ash & Co., Henry Street, Bermondsey
Guy's Hospital Reports—Yearly 10/6—J. & A. Churchill, 7, Great Marlborough Street, W.
Health—Weekly 1d.—358, Strand, W.C.
Homœopathic World—Monthly 6d.—12, Warwick Lane, E.C.
Hospital—Weekly 3d; 15/- per annum—28, 29, Southampton Street, W.C.
Hygiene, Journal of—Quarterly, 21/- per volume—Fetter Lane, E.C.
Incorporated Society for the Destruction of Vermin, Journal of the—Quarterly 2/6—83-91, Great Titchfield Street, W.
Inebriety, British Journal of—Quarterly 1/-—Baillière, 8, Henrietta St., W.C.
Knowledge and Scientific News—Monthly 6d.—27, Chancery Lane, W.C.
Lancet—Weekly 7d.—423, 424, Strand, W.C.
Laryngology, Rhinology, and Otology, Journal of—Monthly 2/-—Adlard & Son, Bartholomew Close, E.C.
Laryngoscope, The—Monthly 1/6—Baillière, 8, Henrietta Street, W.C.
Linnæan Society, Journal of—Irregular, Burlington House, Piccadilly, W.
Linnæan Society's Transactions—Irregular, Price varies—Burlington House, Piccadilly, W.
Liverpool Medico-Chirurgical Journal—Half-yearly, 2/6 each—H. K. Lewis, 136, Gower Street, W.C.
London Hospital Gazette—6/- per annum—5, Rupert Street, E.
Medical Annual—Annually 8/6—John Wright & Sons Lim., Bristol
Medical Chronicle—Monthly 1/6, 12/6 per annum—27, St. Ann Street, Manchester
Medical Directory (Churchill's)—Annually 14/-—J. & A. Churchill, 7, Great Marlborough Street, W.
Medical Directory (Nisbet's)—Annually 7/6—Jas. Nisbet & Co., Lim., 22, Berners Street, W.
Medical Electrology and Radiology—Monthly 1/-—Siegle, Hill & Co., 2, Langham Place, W.
Medical Homes for Private Patients—Annually 6d.—28, 29, Southampton Street, W.C.
Medical Magazine—Monthly 1/-—44, Bedford Row, W.C.

Medical Officer—Weekly 3d.—36–38, Whitefriars Street, E.C.
Medical Press and Circular—Weekly 5d.; 21/- per annum—Baillière, 8, Henrietta Street, W.C.
Medical Register—Annually 10/6—5, New Street Square, E.C.
Medical Review—Monthly 1/6—66, Finsbury Pavement, E.C.
Medical Review of Reviews—Monthly, 10/- per annum—H. Kimpton, 13, Furnival Street, E.C.
Medical Students' Register—Annually 2/6—5, New Street Square, E.C.
Medical Temperance Review—Quarterly 6d.—3–4, London House Yard, E.C.
Medical Times—Weekly 2d.—Basing House, Basinghall Street, E.C.
Medico-Legal Society, Transactions of — Annually, 7/6 — Baillière, 8, Henrietta Street, W.C.
Mental Science, Journal of—Quarterly 5/—J. & A. Churchill, 7, Great Marlborough Street, W.
Meteorological Record—Quarterly 1/6—70, Victoria Street, S.W.
Meteorological Society, Journal of the Royal—Quarterly 5/—70, Victoria Street, S.W.
Microscopical Science, Quarterly Journal of—10/—J. & A. Churchill, 7, Great Marlborough Street, W.
Middlesex Hospital Journal—5/- per annum—140, Wardour Street, W.
Midland Medical Journal—Monthly 4d.—610, Coventry Road, Birmingham
Midwives' Record and Maternity Nurse—Monthly 2d.—Baillière, 8, Henrietta Street, W.C.
Midwives' Roll—Annually, 10/6—5, New Street Square, E.C.
Mind—Quarterly 4/—Macmillan & Co., Lim., St. Martin's Street, W.C.
Nature—Weekly 6d.—Macmillan & Co. Lim., St. Martin's Street, W.C.
New Sydenham Society's Publications —Irregular; Subscription 21/—H. K. Lewis, 136, Gower Street, W.C.
New York Medical Journal—Weekly 6d.—66, West Broadway, New York
New York Medical Record—Weekly 6d.—Wm. Wood & Co., 51, Fifth Avenue, New York
Nursing, British Journal of—Weekly 1d.—11, Adam Street, W.C.
Nursing Directory—Annually 5/—83–91, Great Titchfield Street, W.
Nursing Mirror—Weekly, 1d.—28 and 29, Southampton Street, W.C.
Nursing Notes—Monthly 2d.—12, Buckingham Street, W.C.
Nursing Times—Weekly 1d.—Macmillan & Co., Lim., St. Martin's Street, W.C.
Obstetrics and Gynæcology of the British Empire, Journal of—Monthly 2/6—Sherratt & Hughes, 33, Soho Square, W.
Odontological Society, Transactions of—Monthly, during Sessions, 2/6—83 to 89, Great Titchfield Street, W.
Ophthalmic Hospital Reports, The Royal London—At intervals 5/—J. & A. Churchill, 7, Great Marlborough Street, W.
Ophthalmic Review—Monthly 1/6—33, Soho Square, W.
Ophthalmological Society's Transactions—Yearly 12/6—J. & A. Churchill, 7, Great Marlborough Street, W.
Ophthalmoscope—Monthly 1/—Pulman & Sons, Lim., 24, Thayer Street, W.
Pharmaceutical Journal—Weekly 6d.—72, Great Russell Street, W.C.
Pharmacy, Monthly Magazine of—Monthly 6d.—12 & 16, Coleman St., E.C.
Pharmacy, Year Book of—Annually 10/—J. & A. Churchill, 7, Great Marlborough Street, W.
Physiology, Journal of—Quarterly, 21/- per volume—Fetter Lane, E.C.
Polyclinic—Monthly 6d.—Bale, Sons & Danielsson, Lim., 83–91, Great Titchfield Street, W.
Practitioner—Monthly 2/6—The Practitioner, Lim., 2, Howard Street, Strand, W.C.
Prescriber—Monthly 6d., post free, 5/- per annum—137, George Street, Edinburgh
Progressive Medicine—Quarterly 12/—129, Shaftesbury Avenue, W.C.
Psychical Research Society, Proceedings of the—Occasionally—20, Hanover Square, W.

Public Health—Monthly 1/6—1, Upper Montague Street, W.C.
Public Health, Journal of the Royal Institute of—Monthly 2/-—83-91, Great Titchfield Street, W.
Quarterly Journal of Medicine—Quarterly, 8/6—Oxford University Press, Amen Corner, E.C.
R.A.M.C., Journal of the—Monthly 2/-—Bale, Sons & Danielsson, Lim., 83-91, Great Titchfield Street, W.
Röntgen Ray and Allied Phenomena, Archives of the—Monthly, 16/- per annum—Rebman, Lim., 129, Shaftesbury Avenue, W.C.
Röntgen Society, Journal of the—Quarterly 4/-—Smith & Ebbs, Lim., Northumberland Alley, Fenchurch Street, E.C.
Royal Academy of Medicine in Ireland, Transactions of—Annually 15/-—Baillière, 8, Henrietta Sreet, W.C.
Royal Anthropological Institute, Journal of the—Half-yearly 15/-—3, Hanover Square, W.
Royal Dental Hospital Gazette—Quarterly 1/-—83-91, Great Titchfield St.,W.
Royal Microscopical Society, Journal of the—Bi-Monthly 6/-—5, Queen Victoria Street, E.C.
Royal Sanitary Institute, Journal of the—14/- per annum—12-14, Long Acre, W.C.
Royal Society of Medicine, Proceedings of the—Monthly 7/6—Longmans, Green, & Co., 39, Paternoster Row, E.C.
Sanitary Record—Weekly 3d.; 14/- per annum—5, Fetter Lane, E.C.
Science Progress in the 20th Century—Quarterly 5/-—John Murray, 50a, Albemarle Street, W.
South African Medical Record—Fortnightly, 1/-; 21/- per annum—Baillière, 8, Henrietta Street, W.C.
St. Bartholomew's Hospital Journal—Monthly 6d.—St. Bartholomew's Hospital, E.C.
St. George's Hospital Gazette—Monthly 6d.—Baillière, 8, Henrietta St., W.C.
St. Mary's Hospital Gazette—Monthly, 5/- per annum—187, Edgware Rd., W.
St. Thomas's Hospital Reports—Yearly 8/6—J. & A. Churchill, 7, Great Marlborough Street, W.
Surgery, Gynæcology, and Obstetrics—Monthly, 2/6; 25/- per annum—Baillière, 8, Henrietta Street, W.C.
Therapeutic Gazette—Monthly, 10/- per annum—19, Great Pulteney St., W
Therapist, The—Monthly 6d.; 5/- per annum—1-5, Marylebone Lane, W.
Tropical Life—Monthly 1/-—83-91, Great Titchfield Street, W.
Tropical Medicine and Hygiene, Journal of—Fortnightly 1/-—83-91, Great Titchfield Street, W.
Tuberculosis—Quarterly 6d.—Adlard & Son, 22½, Bartholomew Close, E.C.
Tuberculosis, British Journal of—Quarterly 1/6—Baillière, 8, Henrietta Street, W.C.
Veterinary Journal—Monthly 1/-—Baillière, 8, Henrietta Street, W.C.
Veterinary News—Weekly 2d.—Baillière, 8, Henrietta Street, W.C.
West London Medical Journal—Quarterly 1/-—22½, Bartholomew Close, E.C.
Westminster Hospital Gazette—Monthly 6d.—Baillière, 8, Henrietta Street, W.C.
Zoologist—Monthly 1/-—54, Hatton Garden, E.C.

SELECTED MEDICAL TRADES DIRECTORY.

Bandages, and Antiseptic Dressing Manufacturers.

Galen Manufacturing Co. Lim., Wilson St., New Cross Rd., S.E.
Gardner, J. & Son, 32, Forrest Road, Edinburgh
Liverpool Lint Co., Netherfield Road North, Liverpool
May, Roberts & Co., 9 & 11, Clerkenwell Road, E.C.
Robinson & Sons, Lim., Chesterfield
St. Dalmas & Co., A. de, Leicester
Statham, H. & Co., Corporation St., Manchester

Bottle Makers.

Isaacs, I. & Co., 106, Midland Road, St. Pancras, N.W.
Kilner Bros., Lim., 8, Great Northern Goods Station, King's Cross, N.
Youldon, E., Lim., Carter Street, Maplin Street, E.

Dietetic Articles (Manufacturers of).

Abbott, Van & Sons, Baden Place, Crosby Row, Borough, S.E.
Allen & Hanburys, Lim., Plough Court, Lombard Street, E.C.
Back, Geo. & Co., Devonshire Square, Bishopsgate, E.C.
Benger's Food, Lim., Otter Works, Manchester
Blake, Sandford & Blake, 49, Dover Street, W. (Aerated Waters)
Bonthron & Co., Lim., 50 & 52, Glasshouse St., & 106, Regent St., W.
Bovril, Lim., 152, Old Street, E.C.
Brand & Co., Lim., Mayfair, S.W.
Brown, Gore & Co., Tower House, 40, Trinity Square, E.C. (Gautier Frères' Brandy)
Burrow, W. & J., Malvern (Mineral Waters)
Cadbury Bros., Lim., Birmingham
Callard & Co., 74, Regent Street, W.
Carnrick & Co., Lim., 24 & 25, Hart Street, W.C.
Frame Food Co., Lim., Standen Rd., Southfields, S.W.
Fry, J. S. & Sons, Lim., Bristol & London
Green, R. & Sons, 76, Chalk Farm Road, N.W.
Ingram & Royle, Lim., 26, Upper Thames Street, E.C. (Mineral Waters)
International Plasmon, Limited, 66a, Farringdon Street, E.C.
Keen, Robinson & Co., Lim., Denmark Street, St. George's-in-the East, E.
Liebig's Extract of Meat Co., Lim., 4, Lloyd's Avenue, E.C.
Malted Milk, Lim., (Manufacturers of Horlick's Malted Milk), Slough, Bucks.
Maltine Manufacturing Co., Lim., 24 & 25, Hart Street, W.C.
Manhu Food Co., Lim., 23, Blackstock Street, Liverpool
Mellin's Food Lim., Peckham, S.E.
Montgomerie & Co., Lim., 364, Dumbarton Road, Partick, Glasgow (Bermaline Bread).
Neave, J. R. & Co., Fordingbridge
Ridge's Food Co., 150, Boleyn Road, London, N.
Robb, Alex. & Co., 79, St. Martin's Lane, W.C.
Rowntree & Co., Lim., York
Savory & Moore, Lim., 143, New Bond Street, W.
Saxlehner, Andreas, Trafalgar Buildings, Charing Cross, W.C. (Mineral Waters)
Scott & Bowne, Lim., 10-11, Stonecutter Street, E.C.
Sumner, R. & Co., Lim., Lord Street, Liverpool
Wander, A., Ph.D., 1 & 3, Leonard Street, City Road, E.C.

Druggists (Principal Wholesale).

Allen & Hanburys, Lim., Plough Court, Lombard Street, E.C.
Anglo-American Pharmaceutical Co., Lim., Croydon
Baiss Bros. & Stevenson, Lim., Jewry Street, E.C.
Barron, Harveys & Co., 6, Giltspur Street, E.C.
Battley & Watts, Fore Street, E.C.
Bayer Co., Lim., 19, St. Dunstan's Hill, E.C.
Blake, Sandford & Blake, 49, Dover Street, W.
Buchner, Schacht & Co., 149, Houndsditch, E.C.
Bullock, J. L. & Co., 3, Hanover Street, W.
Burgoyne, Burbidges & Co. 12 & 16, Coleman Street, E.C.

Burroughs Wellcome & Co., Snow Hill Buildings, E.C.
Christy, Thos. & Co., 4, 10, & 12, Old Swan Lane, E.C.
Corbyn, Stacey & Co., Lim., 671, Commercial Road East, E.
Dakin Bros., Lim., 82, Middlesex Street, E.
Denver Chemical Mfg. Co., St. Ann's Road, Bow, London, E., and New York
Duncan, Flockhart & Co., 143, Farringdon Rd., E.C., & Edinburgh
Evans, Gadd & Co., Lim., Exeter and Bristol
Evans, Sons, Lescher & Webb Lim., 60, Bartholomew Close, E.C., and Liverpool
Ferris & Co., Lim., Bristol
Fletcher, Fletcher & Co., Lim., 469, Holloway Road, N.
Formalin Hygienic Co., Lim., 3, Lloyd's Avenue, E.C.
Gale & Co., 15, Bouverie Street, E.C.
General Apothecaries' Co., Lim., 49, Berners Street, W.
Giles, Schacht & Co., Clifton, Bristol
Hearon, Squire & Francis, Lim., 38 & 40, Southwark Street, S.E.
Hewlett, C. J. & Son, Lim., 35-42, Charlotte Street, E.C.
Howards & Sons, Lim., Stratford, E.
Hygienic (The) Co., Lim., 39, Southwark Bridge Road, S.E.
Kühn, B. & Co., 16, Rood Lane, E.C.
Lloyd, T. Howard & Co., Leicester
Lorimer & Co., Lim., Britannia Row, Islington, N.
Macfarlan, J. F. & Co., Edinburgh, and 9 & 11, Moor Lane, E.C.
Martindale, W., 10, New Cavendish Street, W.
Meister, Lucius & Brüning, Lim., 51, St. Mary Axe, E.C.
Menley & James, Ltd., Menley House, Farringdon Road, E.C.
Merck, E., 16, Jewry Street, E.C.
Midgley, Charles, Lim., 23, St. Ann's Square, Manchester
Morson, T. & Son, 14, Elm Street, Gray's Inn Road, W.C.
Newbery, F. & Sons, Lim., Charterhouse Square, E.C.
Oppenheimer, Son & Co., Lim., 179, Queen Victoria Street, E.C.
Parke, Davis & Co., 50–54, Beak Street, Regent Street, W.
Phillips (Chas. H.) Chemical Co., 14, Henrietta Street, W.C.
Quibell Bros., Lim., Newark.
Raimes & Co., York
Reynolds & Branson, Lim., 13, Briggate, Leeds
Richards, J. M. & Sons, Lim., 46, Holborn Viaduct, E.C.
Roberts & Co., 76, New Bond Street, W.
Rogers, F. A., 327, Oxford Street, W.
Saccharin Corporation, Lim., 165, Queen Victoria Street, E.C.
Savory & Moore, Lim., 143, New Bond Street, W.
Smith, T. & H., Lim., 21, Duke St. Edinburgh; and 22 City Road, E.C.
Southall Bros. & Barclay, Lim., Birmingham
Squire & Sons, 413, Oxford Street, W.
Sumner, R. & Co., Lim., 50A, Lord Street, Liverpool
Symes & Co., Lim., Liverpool
Wander, A., Ph. D., 1 & 3, Leonard Street, City Road, E.C.
Widenmann, Broicher & Co., 33, Lime Street, E.C.
Willows, Francis, Butler & Thompson, Lim., 40, Aldersgate Street, E.C.
Woolley, Jas., Sons & Co., Lim., Victoria Bridge, Manchester
Wright, Layman & Umney, Lim., 48, Southwark Street, S.E.
Wyleys, Lim., Coventry
Zimmermann, A. & M., 3, Lloyd's Avenue, E.C.
Zimmermann, Chas. & Co., 9 & 10 St. Mary-at-Hill, E.C.

Medical Transfer Agencies.

Scholastic, Clerical & Medical, Assoc. Lim., 22, Craven Street, W.C.

Opticians.

Curry & Paxton, 195 199, Great Portland Street, W.
Davidson, F. & Co., 29, Great Portland Street, W.
Newton & Co., 3, Fleet Street, E.C.
& 471, Hornsey Road, N.
Priest & Ashmore, Sheffield
Ross, Lim., 111, New Bond Street, W.
Watson, W., & Sons, 313, High Holborn, W.C.

Printers.

Cassell & Co., Lim., Ludgate Hill, E.C.
Morrison & Gibb, Lim., Edinburgh
Wright, John & Sons Lim., Stone Bridge, Bristol

Publishers and Booksellers (Medical).

Adlard & Son, Bartholomew Close, E.C.
Appleton & Co., 25, Bedford Street, Covent Garden, W.C.
Arnold, Edward, 41 & 43, Maddox Street, W.
Baillière, Tindall & Cox, 8, Henrietta Street, W.C.
Bale John Sons & Danielsson, Lim., 83-91, Great Titchfield St., W.
Cassell & Co., Lim., La Belle Sauvage, Ludgate Hill, E.C. (and Printers).
Churchill, J. & A. 7, Great Marlborough Street, W.
Clay, C. F., Cambridge University Press Warehouse, Fetter Lane, E.C.
Cornish Bros., Lim., 37, New Street, Birmingham
Fannin & Co., Lim., Grafton Street, Dublin
Glaisher, H. J., 57, Wigmore St., W.
Green, Wm. & Sons, 2 & 4, St. Giles Street, Edinburgh
Griffin, Chas. & Co., Lim., 12, Exeter Street, Strand, W.C.
Hirschfeld Bros., Lim., 13, Furnival Street, E.C.
Johnston, W. & A. K., Lim., Edinburgh
Kimpton, Hy., 13, Furnival Street, E.C.
Lewis, H. K., 136, Gower Street, W.C.
Lippincott, J. B. Co., 5, Henrietta Street, W.C.
Livingstone, E. & S., Teviot Place, Edinburgh
Longmans, Green & Co., 39, Paternoster Row, E.C.
Maclehose, J. & Sons, 61, St. Vincent Street, Glasgow
Macmillan & Co., Lim., St. Martin's Street, W.C.
Medical Publishing Co., Lim., 22½, Bartholomew Close, E.C.
Murray, John, Albemarle Street, W.
Nisbet, Jas. & Co., Lim., 22, Berners Street, W.
Oxford Medical Publications (Henry Frowde and Hodder & Stoughton), 20, Warwick Square, E.C.
Paul (Kegan), Trench, Trübner & Co., Lim., 43, Gerrard Street, W.
Rebman, Limited, 129, Shaftesbury Avenue, W.C.
Renshaw, Henry, 356, Strand, W.C.
Saunders, W. B. Co., 9, Henrietta Street, W.C.
Scientific Press Lim., 28 and 29, Southampton Street, W.C.
Sherratt & Hughes, University Press, 34, Cross Street, Manchester.
Simpkin, Marshall, Hamilton, Kent & Co., Lim., Stationers' Hall Court and Paternoster Row, E.C.
Smith, Elder & Co. 15, Waterloo Place, S.W.
Thacker, W. & Co., 2, Creed Lane, E.C. (Thacker, Spink & Co., Calcutta)
Whittaker & Co., White Hart Street, Paternoster Square, E.C.
Wright, John & Sons Lim., Stone Bridge, Bristol (and Printers); London Showroom, 14, Paternoster Square, E.C.

Surgical Instrument and Appliance Manufacturers.

Allen & Hanburys, Lim., 48, Wigmore Street, W., and 37, Lombard St., E.C.
Arnold & Sons, 42, Beaumont Street, W., and West Smithfield, E.C.
Bailey, W. H. & Son, 38, Oxford Street, W.
Browne & Sayer, 104, Upper Thames Street, E.C.
Clarke, John & Co., Lim., 8, Donegall Square West, Belfast
Cocking, J. T., Clifton Pl., Plymouth.
Coles, William & Co., 5, Sackville St., Piccadilly, W.
Cox, Alfred & Sons, 120, New Bond Street, W.
Coxeter & Son, 30-32, Seaton Street, Hampstead Road, N.W.
Critchley, J. & Sons, 18, Great George Street, Liverpool
Dinneford & Co., 17, Mortimer St., W.
Domen Belts Co., Lim., 456, Strand, W.C.
Down Bros., Lim., 21, St. Thomas's Street, S.E.
Ernst, F. Gustav, 80 & 82, Charlotte Street, Fitzroy Square, W.
Evans & Wormull, 31, Stamford Street, S.E.
Fannin & Co., Lim., Grafton Street, Dublin
Ferris & Co., Lim., Bristol
Gale, Geo. & Sons, Lim., Birmingham (Spring Bedsteads)
Gardner, J. & Son, 32, Forrest Road Edinburgh

Grossmith, W. R., 110, Strand, W.C.
Hancock, Edwin & Co., 32, Westgate Street, Bath
Hawksley, T., 357, Oxford Street, W.
Haywood, J. H., Castle Gate, Nottingham
Hearson, Chas. & Co., Lim., 235, Regent Street, W.
Hills & Co., 46, Newcomen Street, Borough, S.E.
Holborn Surgical Instrument Co., Lim., 26, Thavies Inn, E.C.
Holden Bros., 3, Harewood Place, Oxford Street, W.
Holland & Son, 46, South Audley Street, W.
Hooper & Co., 7, Pall Mall East, S.W.
Huxley, E. & Son, 13, Old Cavendish Street, W.
Jacobson, Richard, 70, Shoe Lane, E.C.
Krohne & Sesemann, 37, Duke Street, Manchester Square, W.
Maw, S., Son & Sons, 7 to 12, Aldersgate Street, E.C.
Mayer & Meltzer, 71, Great Portland Street, W.
Medical Supply Association, 228 230, Gray's Inn Road, W.C.
Montague, J. H., 69, New Bond Street, W.
Mottershead & Co., 7, Exchange St., Manchester (Electrical)
Newton & Co., 3, Fleet Street, E.C., and 471, Hornsey Road, N. (Electrical and Scientific)
Reynolds & Branson, Lim., 13, Briggate, Leeds
Rogers, F. A., 327, Oxford Street, W.
Schramm, K. R. & Co., 116, Albany Street, Regent's Park, N.W.
Statham, H. & Co., Corporation St., Manchester
Stevens, J. C., 21 & 23, Marylebone Lane, W.
Sumner, R. & Co., Lim., Lord Street, Liverpool
Weiss, John & Son, Lim., 287, Oxford Street, W.
White's Moc-main Patent Lever Truss Co., Lim., 98, Shaftesbury Avenue, W.
Woolley, Jas. Sons & Co., Lim., Victoria Bridge, Manchester
Young, Archibald & Son, 57-61 Forrest Road, Edinburgh

Thermometer Manufacturers.

Hicks, J. J., 8–10, Hatton Garden, E.C.
Zeal, G. H. 82, Turnmill Street, E.C

Vaccine Lymph.

Lymph is supplied, to Public Vaccinators, free of charge, on application to the Government Lymph Establishment, Colindale Avenue, The Hyde, N.W.
Arents, E. (Dr. Doucet's), 48, Surrey Square, Old Kent Road, S.E.
Association for the Supply of pure Vaccine Lymph, 14a, Great Marlborough Street, W.
Birmingham Calf Lymph Establishment, 204, Victoria Road, Aston
Fannin & Co., Lim., Dublin
Faulkner's Vaccine Institution, 59, Valetta Road, Acton, S.W.
Ferris & Co., Lim., Bristol
Jenner Institute for Calf Lymph, 73 Church Road, Battersea, S.W.
Rebman, Lim., 129, Shaftesbury Avenue, W.C.
Renner's (Dr.) Establishment, 75, Upper Gloucester Place, N.W.
Roberts & Co. (Dr. Chaumier's), 76, New Bond Street, W.
Wyleys, Lim., Coventry.

NOTE BOOK.

It is easier to make a note of a thing than to remember *where* the note was made. The following pages are indexed under their respective headings, and any note can be immediately found when required.

NOTES.

Copy here any formula or fact you wish to keep for reference. (These pages are indexed under the word "Notes.")

BISEDIA

An Elegant and Effective Preparation for GASTRO-INTESTINAL DISTURBANCE COMPLICATED WITH VOMITING.

See full announcement on page xxxvi.

GILES, SCHACHT & CO., CLIFTON, BRISTOL.

NOTES.

COLES' SPIRAL SPRING TRUSS.

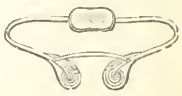
INVENTORS AND MAKERS

WILLIAM COLES & CO.,

5, Sackville Street, Piccadilly, LONDON, W.

(LATE 225, PICCADILLY, W.)

Particulars by post.



NOTES.

COLES' SPIRAL SPRING TRUSS.

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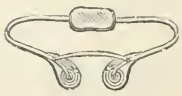
WILLIAM COLES & CO.,

5, Sackville Street, Piccadilly, LONDON, W.

(LATE 225, PICCADILLY, W.)



Particulars by post.

NOTES.

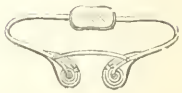
COLES' SPIRAL SPRING TRUSS.

INVENTORS AND MAKERS—

WILLIAM COLES & CO.,

5, Sackville Street, Piccadilly, LONDON, W.

(Late 255, Piccadilly, W.)



Particulars by post.

ADDRESSES (PRIVATE).

COLES' SPIRAL SPRING TRUSS.

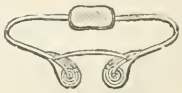
INVENTORS AND MAKERS—

WILLIAM COLES & CO.,

5, Sackville Street, Piccadilly, LONDON, W.

(LATE 225, PICCADILLY, W.)

Particulars by post



NURSES.

Note whether Midwifery or Sick Nurses, their terms and private addresses.

GAUTIER FRÈRES' ESTABLISHED 1755.
FINE LIQUEUR BRANDY.
(20 *YEARS OLD.*) *See Advertisement, page lviii.*

INSTRUMENTS, APPLIANCES, OR MATERIALS WANTED.

HORLICK'S MALTED MILK. A class by itself. Stands alone. Always ready for use. No Cooking required. Pasteurised and partially predigested. Contains the enzymes of malt in active condition.

SEE PAGE L.

Samples from MALTED MILK LTD., (Manufacturers of Horlick's Malted Milk), SLOUGH, BUCKS.

YORKSHIRE

INSURANCE COMPANY, Ltd.

ESTABLISHED 1824.

Chairman RIGHT HON. LORD WENLOCK, K.C.B., G.C.S.I., G.C.I.E.

ACCUMULATED FUNDS exceed - TWO MILLIONS.

FIRE ACCIDENT LIFE.

ENDOWMENTS FOR CHILDREN. AND LEASEHOLD INSURANCES.
WORKMEN'S COMPENSATION. FIDELITY GUARANTEE. BURGLARY
PLATE GLASS LIVE STOCK. TRUSTEE & EXECUTORSHIP
LOSS OF PROFITS (Fire).

LIFE INSURANCE
AT THE
LOWEST POSSIBLE COST.

EXAMPLE, AGE 30:

	£ s. d.
Average rate of 64 British and Colonial Offices ...	2 1 2 %
"Yorkshire" rate	**1 17 3** %

ANNUITIES.

SPECIMEN RATES FOR **£100** PURCHASE MONEY.

	MALES.						FEMALES.					
	60			70			60			70		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
"Yorkshire" ...	**9**	**0**	**0**	**12**	**15**	**0**	**8**	**2**	**6**	**11**	**12**	**0**
Average of other British Offices ...	8	17	0	12	15	0	7	18	1	11	8	2

SEND FOR PROSPECTUSES.

Head Office:
ST. HELEN'S SQUARE, YORK.

London Offices:
BANK BUILDINGS, PRINCES STREET, E.C.
West End: 49, PALL MALL, S.W.
Law Courts: 307, HIGH HOLBORN, W.C.

INDEX TO LIFE ASSURANCE OFFICES.

A, *when Established*; B, C, D, *Annual Premiums to Insure £100 on death, with Profits, at the age of 30, 40, and 50*; E, *Assurance and Annuity Funds, exclusive of Paid-up Capital.* M, *Mutual Offices*; P, *Proprietary Offices.*

Those marked with an asterisk (*) in the E column have not sent revised figures for 1908.

Title, Etc., of Office.	A	B	C	D	E
					£
Abstainers and General, Life, Fire, etc., Edmund St., Birmingham. *Act. and Sec.*, R. A. Craig, A.I.A. .. .. P	1883	40/11	55/10	82/3	410,196
Alliance, Fire, Life, Accident, and Annuities, Bartholomew Lane, E.C. *Gen. Man.*, Robert Lewis .. .. P	1824	48/9	64/5	90/9	11,640,752
Atlas, Fire, Life, and Accident, 92, Cheapside, E.C. *Act.*, Robert Cross. *Gen. Man.*, Saml. J. Pipkin .. .. .. P	1808	49/3	63/7	88/8	2,013,504
Australian Mutual Provident Society, Life, Endowments, and Annuities, 37, Threadneedle Street, E.C. *Res. Sec.*, H. W. Apperley. **Further particulars see page 762.** M	1849	48/2	64/5	89/10	23,446,497
Britannic Assurance Co., Ltd. (*formerly called* British Workman's & General), Life and Endowments, Broad Street Corner, Birmingham. *Chairman*, F. T. Jefferson, J.P. *Sec.*, S. J. Port, F.C.I.S. **Further particulars see page 760** .. P	1866	48/6	65/2	94/-	1,966,481
British Equitable, Life, Fire, Accident, Burglary, Employers' Liability 1, 2, 3, Queen St. Place, E.C. *Man.*, Basil May, F.I.A. P	1854	48/8	64/11	91/9	1,758,362
British Homes Assurance Corporation, Ltd., 6, Paul Street, Finsbury, E.C., Life Assurance and House Purchase. *Man. Director*, M. Gregory. **Further particulars see page 762**	1897	49/1	66/2	94/7	350,000
Caledonian, Fire, Life, Accident, 19, George St., Edinburgh. *Gen. Man.*, Robert Chapman. London Offices, 82, King William Street, E.C., and 14, Waterloo Place, S.W. P	1805	48/9	64/6	88/6	2,539,736
City of Glasgow, Life, 30, Renfield Street, Glasgow. *Gen. Man.*, William S. Nicol. London Office, 12, King William St., E.C. *Lon. Man.*, J. D. Milne .. .. P	1838	48/9	64/6	89/10	2,959,710
Clergy Mutual, Life, 2 & 3, Sanctuary, Westminster. *Act. & Man.*, F. B. Wyatt. *Sec.*, W. N. Neale. **Further particulars see page 759** .. .. M	1829	46/4	62/2	87/4	*4,242,820
Clerical, Medical and General, Life, 15, St. James's Square, and 1, King William Street, E.C. *Act.* and *Sec.*, A. D. Besant P	1824	48/7	66/9	96/3	4,742,737
Colonial Mutual, Life and Annuity, 33, Poultry. *Man.*, Arthur E. Gibbs M	1873	47/4	63/2	89/9	3,077,126
Commercial Union, Fire, Life and Accident, 24, 25, and 26, Cornhill, E.C. *Act.*, H. C. Thiselton .. .. .. P	1861	47/10	65/2	92/4	3,424,063
Co-operative, Life, Accident, Fidelity, and Fire, Corporation Street, Manchester. *Sec.*, James Odgers. **Further particulars see page 762** .. .. .. P	1867	45/8	61/5	88/4	105,835
Eagle, Life, 79, Pall Mall, S.W. *Gen. Man.* and *Sec.*, Geo. R. Jellicoe .. P	1807	50/8	65/5	91/4	2,365,898
Economic, Life, 6, New Bridge Street, Blackfriars. *Act.* and *Sec.*, G. Todd, M.A., F.I.A. .. .. .. M	1823	44/4	59/6	85/5	4,553,486
Edinburgh, Life, Endowments, and Annuities, 26, George Street, Edinburgh. *Man. and Act.*, A Hewat, F.F.A., F.I.A. *Sec.*, T. M. Gardiner. London, 11, King William Street, E.C. *Sec.*, J. J. Bisgood P	1823	47/11	64/2	90/2	4,192,840

A, *when Established;* B, C, D, *Annual Premiums to Insure £100 on death, with Profits, at the age of 30, 40, and 50;* E, *Assurance and Annuity Funds, exclusive of Paid-up Capital.* M, *Mutual Offices;* P, *Proprietary Offices.*

Title, Etc., of Office.	A	B	C	D	E
					£
English and Scottish Law, Life, Annuity, Endowment, and Loan, 12, Waterloo Place, S.W. *Gen. Man.*, Albert G. Scott. *Act.* and *Sec.*, John Spencer, F.I.A. .. P	1839	47/1	62/8	87/9	2,865,455
Equitable Life Assurance Society, Mansion House Street, E.C. *Act.* and *Sec.*, G. J. Lidstone .. .. .. M	1762	53/5	67/11	90/7	4,987,756
Equity and Law, Life, 18, Lincoln's Inn Fields, W.C. *Act.*, W. P. Phelps, F.I.A., M.A. .. .. .. P	1844	48/10	64/6	92/9	4,401,301
Friends' Provident, Life, Annuities, etc., Bradford, Yorkshire. *Sec.*, William H. Gregory. *Act.*, Alfd. Moorhouse, F.I.A. M	1832	48/–	64/–	89/7	3,340,417
General Accident Fire and Life, Perth, Scotland. *Gen. Man.*, F. Norie-Miller, J.P. P	1885	49/2	64/11	91/3	14,845
General, Life, 103, Cannon Street, E.C. *Man.* and *Sec.*, John Robert Freeman. Further particulars see page 760 P	1837	49/10	65/4	92/8	2,051,711
Gresham, Life, St. Mildred's House, E.C. *Gen. Man.* and *Sec.*, James H. Scott P	1848	48/2	64/1	91/5	*9,326,891
Guardian, Fire, Life, Accident, and Burglary, 11, Lombard St., E.C., & 21, Fleet St. *Sec.*, T. G. C. Browne. *Act.*, Ernest Woods P	1821	48/10	64/6	89/3	4,119,025
Law Life, 187, Fleet Street. *Man.*, E. H. Holt. *Act.*, J. E. Faulks .. P	1823	49/4	64/10	91/–	4,227,092
Law Union and Crown, Life, Fire, Accident, Annuities, Burglary, etc., 126, Chancery Lane. *Gen. Man.*, Alex. Mackay P	1825	48/4	64/–	89/10	4,052,087
Legal and General, Life, and Annuities, 10, Fleet Street, E.C. *Act.* and *Man.*, E. Colquhoun .. .. .. P	1836	50/9	65/11	90/9	*4,896,818
Life Association of Scotland, 82, Princes St., Edinburgh. *Man.*, Gordon Douglas. *Sec.* R. M. M. Roddick, London Office, 18, Bishopsgate Street Within, E.C. *Sec.*, J. C. Wardrop .. .. .. P	1838	50/–	65/4	93/4	5,672,403
Liverpool and London and Globe, Fire, Life, Annuities, Accident etc., 1, Dale St., Liverpool. *Gen. Man.* and *Sec.*, A. G. Dent. London Office, 1, Cornhill, E.C. P	1836	49/10	65/9	91/3	5,356,665
London and Lancashire, Life, 66 and 67, Cornhill, E.C. *Gen. Man.* and *Sec.*, W. Æneas Mackay. *Jnt. Asst. Secs.*, E. E. Dent and L. C. Kestin. *Act.*, Harold Dougharty A.I.A., F.C.I.S. .. P	1862	46/10	62/4	86/10	2,263,804
London Assurance Corporation, Fire, Life, and Marine, 7, Royal Exchange. *Man.* of Life Dept., James Clunes. *Act.*, A. G. Hemming .. .. P	1720	49/6	64/11	91/5	2,311,110
London, Edinburgh and Glasgow, Life, Industrial, and Accidents, Euston Square, N.W. *Sec.*, T. V. Cowling. *Gen. Man.*, Thos. Neill .. .. P	1881	48/7	64/9	93/4	913,671
London Life Association, Lim., 81, King William Street, E.C. *Act.* and *Man.*, C. D. Higham, F.I.A. .. M	1806	60/–	79/–	108/–	4,871,446
Marine and General Mutual, Life, and Marine, 14, Leadenhall Street, E.C. *Act.* and *Sec.*, S. Day, F.I.A. .. .. M	1852	48/10	65/11	91/11	1,563,129
Metropolitan Life, 13, Moorgate St., E.C. *Sec.*, Bernard Woods. *Act.*, H. J. Baker M	1835	49/9	66/4	92/–	2,208,588
Mutual Life and Citizens', 5, Lothbury, Bank, E.C. *Man.*, Alfred Gilbert .. P	1886	48/9	65/3	89/9	4,214,788
Mutual Life Insurance Co. of New York, 16, 17 and 18, Cornhill, E.C. *Gen. Man.*, J. H. Harrison Hogge. *Sec.*, T. Crawford M	1843	48/9	66/–	97/–	100,205,146
National Mutual Life, 39, King Street, Cheapside. *Act.* and *Man.*, Geoffrey Marks, F.I.A. *Sec.*, H. J. Lockwood. *Asst Act.*, C. R. V. Coutts, F.I.A. M	1830	48/4	63/7	89/6	2,793,429

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Title, Etc., of Office.	A	B	C	D	E
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National Mutual Life Association of Australasia, Ltd., 5, Cheapside, E.C. *Man.*, John B. Gillison, F.I.A., F.F.A. Further particulars see page 758 M	1869	46/8	61/6	87/2	4,844,002
National Provident, 48, Gracechurch Street, E.C. *Act.* and *Sec.*, L. F. Hovil M	1835	50/2	66/3	91/1	6,500,000
New York Life, Trafalgar Buildings, Trafalgar Square, London, W.C. *Sec.*, Wm. R. Collinson, F.C.I.S. .. .. .. M	1845	48/9	66/–	96/11	114,514,881
North British and Mercantile, Fire, Life, Burglary, and Annuities, 61, Threadneedle St., E.C., and 64, Princes St., Edinburgh. *Life Man.* and *Act.*, London, H. Cockburn. *Jt. Man.*, D. C. Haldeman. *Sec.*, R. Carmichael. Further particulars see page 757 .. .. .. P	1809	49/10	66/1	91/11	14,124,573
Northern Assurance, 1, Moorgate St., E.C. *Gen. Man.*, H. E. Wilson .. P	1836	49/–	64/8	90/10	4,758,772
Norwich Union, Life, Norwich. *Gen. Man.* and *Act.*, J. J. W. Deuchar. London Office, 50, Fleet Street, E.C.	1808	45/8	59/6	85/3	8,132,104
Pearl, Life, London Bridge, City, E.C. *Jnt. Man'g Directors*, F. D. Bowles, Esq., J.P., C.C. G. Shrubsall, J.P. .. P	1864	49/–	65/–	92/–	3,576,599
Phœnix Assurance, 19 & 70, Lombard St., 57, Charing Cross. *Gen. Man.*, G. H. Ryan, F.I.A. P	1782	48/11	64/7	90/8	5,345,415
Provident Clerks & General Mutual Life Assurance Association, 27 & 29, Moorgate St., E.C. *Sec.*, John E. Gwyer M	1840	46/4	62/8	92/2	2,529,066
Prudential (Ordinary), Life, Holborn Bars. *Jnt. Secs.*, D. W. Stable and J. Smart. Further particulars see page 758 P	1848	49/6	65/11	91/11	37,629,062
Refuge, Life, Oxford St., Manchester. *Joint Mans.*, R. Wm. Green & John W. Proctor. London Office, 133, Strand, W.C. P	1864	40/3	65/9	91/9	5,234,509
Rock, Life and Endowments, Educational and Life Annuities, Investment, etc., 15, New Bridge Street, E.C. *Man.* and *Act.*, R. Stirling, F.I.A., F.F.A. .. P	1860	48/1	64/6	90/1	2,289,802
Royal Exchange Assurance, Fire, Life, Annuities, etc., Royal Exchange and 29, Pall Mall. *Act.*, H. E. Nightingale, F.I.A. Further particulars see page lxxxiii P	1720	49/–	64/9	90/2	3,317,018
Royal, Fire, Life, Annuities, and Accident, Royal Insurance Buildings, Liverpool. *Man.*, Chas. Alcock. London Offices, Lombard Street. *Sec.*, R. M'Connell P	1845	49/9	64/1	88/3	9,691,009
Sceptre, Life and Endowments, 40, Finsbury Pavement, E.C. *Sec.*, W. E. Wright P	1864	48/8	64/8	90/6	1,133,137
Scottish Amicable, Life, St. Vincent Place, Glasgow. *Man.*, W. Hutton. *Sec.*, C. Guthrie M	1826	51/9	66/3	90/1	5,046,400
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Scottish Provident, Life & Annuities, 6, St. Andrew Square, Edinburgh. *Man.*, J. G. Watson. *Joint Secs.*, J. Lamb and R. T. Boothby. *Asst. Sec.*, C. W. Thomson. *Act.*, W. G. Walton. London Offices, 3, Lombard Street, E.C., and 17, Pall Mall, S.W. M	1837	42/4	56/6	83/2	14,000,000

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Scottish Temperance, Life & Accident, 105, St. Vincent Street, Glasgow. *Manager*, Adam K. Rodger. London, 2, 3 & 4, Cheapside. *Man.*, W. A. Bowie. *Less 10 per cent to Abstainers* .. .. P	1883	48 0	63 9	89/10	1,316,318
Scottish Union & National Fire, Life, Accident, Pensions Annuities, etc., 35, St. Andrew Sq., Edinburgh. *Gen. Man.*, J. A. Cook. London Office, 3, King William Street, E.C. *Sec.*, William G. Glennie P	1824	50 9	65 6	91/–	4,571,033
Scottish Widows' Fund, Life & Survivorship, 9, St. Andrew Square, Edinburgh. *Man. & Act.*, N. B. Gunn. *Sec.*, J. G. C. Cheyne. London Offices, 28, Cornhill, E.C., and 5, Waterloo Place, S.W. *Sec.*, J. W. Miller M	1815	51 9	66 3	90/7	18,899,983
Standard Life, 3, George Street, Edinburgh. *Man.*, Leonard W. Dickson. London Offices, 83, King William St., and 3, Pall Mall East. *Sec.*, J. H. W. Rolland P	1825	48/11	64 8	89/–	11,900,651
Star, Life, Annuities, Endowments, 32, Moorgate St., City. *Man.* and *Act.*, J. Douglas Watson .. .. .. P	1843	48 1	64 11	90/6	6,838,005
Sun, Life, 63, Threadneedle Street, E.C. *Act.*, R. G. Salmon, F.I.A. *Sec.* and *Gen. Man.*, E. Linnell .. .. P	1810	40 2	60 6	94 2	6,969,808
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Wesleyan and General, Life, Annuities, Sickness, Assurance Buildings, Steelhouse Lane, Birmingham. *Gen. Man.*, R. A. Hunt, F.S.S., A.I.A. London Office, 101, Finsbury Pavement, E.C. Further particulars see page 760 M	1841	48 1	68 8	93/10	1,221,075
Yorkshire, Fire and Life, St. Helen's Sq., York. London Office, 2, Bank Buildings, Princes Street. Further particulars see page 752 P	1824	49/1	64/9	91/7	1,781,318

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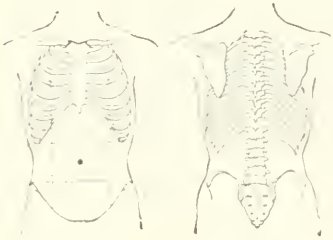

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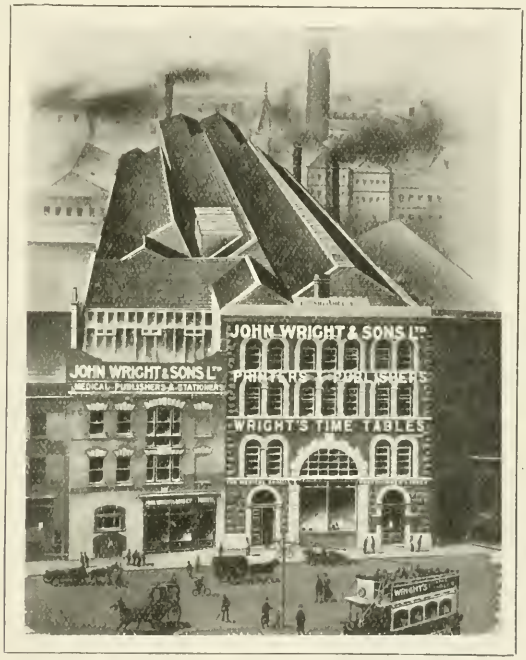

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COURSES OF STUDY.

Instruction is provided in all subjects of the curriculum, under Recognised Teachers of the University of London, as follows:—

(*a*) **Preliminary Scientific.**—Complete Courses in Chemistry, Physics, and Biology. Students can join in January, April, or October.

(*b*) **Intermediate.**—Systematic Courses of Anatomy, Physiology, and Pharmacology, with Special Tutorial Classes for the Inter. M.B., London and Primary F.R.C.S.

(*c*) **Final.**—Systematic Lectures, Clinical Instruction, and Tutorial Classes in Medicine, Surgery, Obstetrics, and the various Special Departments. Full Laboratory Courses in General and Special Pathology; also in Bacteriology and Chemical Pathology with especial Reference to their clinical application.

CLINICAL PATHOLOGY AND OPSONIN DEPARTMENT.

Advanced Courses of Clinical Pathology and Bacteriology, under the direction of Sir Almroth Wright, F.R.S., are held throughout the year, and practical experience in Opsonic Investigations may be obtained in the Department of Therapeutic Inoculation.

RESIDENT MEDICAL OFFICERS.

Eighteen are appointed Annually by Competitive Examination.

Six Entrance Scholarships in Natural Science, value from £145 to £25 are awarded annually by Examination in September.

Three General Proficiency Scholarships (£20 each) and upwards of thirty other Scholarships and Prizes are offered for competition among the Students of the School each year.

HOSPITAL STAFF.

Consulting Physicians—Dr. CHEADLE, Dr. LEES.
Consulting Surgeons—Mr. A. T. NORTON, C.B., Mr. EDMUND OWEN, Mr. H. W. PAGE; (Aural) Mr. G. P. FIELD; (Ophthalmic) Sir G. A. CRITCHETT; (Skin) Sir MALCOLM MORRIS; (Dental) Mr. MORTON SMALE; (Throat) Dr. SCANES SPICER. Consulting Anæsthetist: Mr. HENRY DAVIS.
Physicians—Dr. S. PHILLIPS, Dr. A. P. LUFF, Dr. H. A. CALEY; (Out-patients) Dr. W. HARRIS, Sir JOHN BROADBENT, Dr. W. H. WILLCOX.
Surgeons—Mr. A. J. PEPPER, Mr. J. E. LANE, Mr. H. S. COLLIER; (Out-Patients) Mr. V. W. LOW, Mr. W. H. CLAYTON-GREENE, Mr. MAYNARD SMITH.
Physicians-Accoucheur—Dr. M. HANDFIELD-JONES; (Out-Patients) Dr. W. J. GOW.
Ophthalmic Surgeon—Mr. H. E. JULER. *Assistant Ophthalmic Surgeon*—Mr. LESLIE PATON.
Surgeons to Ear, Nose, and Throat Department—Dr. WM. HILL, Mr. C. I. GRAHAM.
Physician in charge of Skin Department—Dr. GRAHAM LITTLE.
Dental Surgeon—Mr. W. H. DOLAMORE.
Director of Inoculation Department—Sir ALMROTH WRIGHT, F.R.S.

LECTURERS.

Clinical Medicine—Dr. PHILLIPS.
Clinical Surgery—Mr. PEPPER.
Medicine—Dr. LUFF, Dr. CALEY.
Surgery—Mr. LANE, Mr. COLLIER.
Practical Surgery—Mr. LOW, Mr. MAYNARD SMITH.
Pathology—Sir ALMROTH WRIGHT, F.R.S., Dr. SPILSBURY (Assistant Lecturer).
Bacteriology—Sir ALMROTH WRIGHT, F.R.S. Capt. DOUGLAS, I.M.S. (Assist. Lecturer).
Pathological Chemistry—Dr. W. H. WILLCOX.
Midwifery—Dr. M. HANDFIELD-JONES.
Pharmacology—Dr. H. A. CALEY.
Forensic Medicine—Dr. WILLCOX.
Hygiene—Dr. WILLCOX.
Mental Diseases—Dr. HYSLOP.
Neurology—Dr. HARRIS
Anatomy—Mr. W. H. CLAYTON-GREENE.
Physiology and Histology—Dr. N. H. ALCOCK.
Biology—Dr. RIDEWOOD.
Chemistry—Dr G. SENTER.
Physics—Mr. W. H. WHITE.

For Calendar of the Medical School, giving full information as to Courses of Study, Fees, etc., apply to the Dean, Mr. CLAYTON-GREENE, or to Mr. B. E. MATTHEWS, School Sec.

LONDON SCHOOL OF DERMATOLOGY.

Conducted by the Medical Staff of ST. JOHN'S HOSPITAL FOR DISEASES OF THE SKIN, Leicester Square, W.C.

Those desirous of acquiring a practical knowledge of the Histo-Pathology and Bacteriology of the Skin and of General Bacteriology, can make arrangements for instruction, either alone or in class, by applying by letter to the Secretary of the School at the above address.

Advanced Courses and Research work can be arranged for. Those studying in the Laboratory have the privilege of attending the practice of the Hospital. Microscopes are provided, and students may take away the specimens mounted.

GEORGE A. ARNAUDIN, *Secretary.*

ST. JOHN'S HOSPITAL FOR DISEASES OF THE SKIN

(INCORPORATED).

Out-Patient Department - - - - LEICESTER SQUARE, W.C.
In-Patient Department (45 Beds) - - UXBRIDGE ROAD, W.

The NEW OUT-PATIENT DEPARTMENT is now open and contains Laboratory, Lecture Room, Electric Room fitted with Finsen Light, X Ray, High Frequency and Sabouraud's Treatment of Ringworm.

The OUT-PATIENT PRACTICE is open free to the Medical Profession every day from 2 to 4 p.m.

CLINICAL DEMONSTRATIONS are given every Monday (Dr. DOCKRELL) at 2 p.m., Tuesday (Dr. EDDOWES) at 2 p.m., Wednesday (Dr. SAVILL) at 3 p.m., Thursday (Dr. HARGREAVES) at 2 p.m., Friday (Mr. DAWSON) at 2 p.m., or Selected Cases.

CHESTERFIELD LECTURES.

These Lectures are given by Dr. Morgan Dockrell on Thursdays at 6 o'clock, during the Winter months, and are followed by Demonstrations and Clinical Instruction on Special Cases.

Full particulars may be obtained from the Secretary.

GEORGE A. ARNAUDIN, *Secretary-Superintendent.*

THE

ROYAL DENTAL HOSPITAL

AND LONDON SCHOOL OF DENTAL SURGERY,

LEICESTER SQUARE, LONDON, W.C.

The Royal Dental Hospital was founded in 1858 at Soho Square, and in March, 1874, was removed to Leicester Square. The increased demands made on it by the public and the rapid growth of the Medical School necessitated the erection of an entirely new building. The new Hospital was opened in March, 1901, and is complete in every detail with modern appliances, and the School portion of the building thoroughly equipped for teaching purposes. The clinic of the Hospital is unrivalled. In 1907, 104,745 operations were performed.

The following SCHOLARSHIPS and PRIZES are open for competition:

The ENTRANCE SCHOLARSHIP, of the value of £20, awarded in October.
The SAUNDERS SCHOLARSHIP, of the value of £20.
The STORER-BENNETT RESEARCH SCHOLARSHIP, of the value of £50.
The ALFRED WOODHOUSE SCHOLARSHIP, of £35.
The ROBERT WOODHOUSE PRIZE, of the value of £10.

INSTRUCTION IN MECHANICAL DENTISTRY.

The instruction in Mechanical Dentistry as required for the Dental Curriculum can be obtained at this Hospital.

Further particulars concerning Fees, Scholarships, &c., can be obtained on application to

. . . THE DEAN.

The Royal Westminster Ophthalmic Hospital,

King William Street, Charing Cross, LONDON.

The Practice of this Hospital is open to Practitioners and Students from 1 to 4.30 p.m. daily.

Special Instruction is given in the Diagnosis, Pathology, and Treatment of all EYE AFFECTIONS, including the Operation on the Eye, the Treatment of Errors of Refraction, and the Use of the Ophthalmoscope. For Special Classes, see weekly Medical Journals.

Terms for six months, £3 3s.; perpetual, £5 5s.

FOR PARTICULARS, APPLY TO MR. MCMULLEN AT THE HOSPITAL.

HOSPITAL FOR DISEASES OF THE THROAT.

GOLDEN SQUARE, LONDON, W.

CLINICAL INSTRUCTION.

Clinical Instruction in Diagnosis and Treatment of Disease is given daily in the Out-Patient Department from 2.30 to 5 p.m., on Tuesdays and Fridays from 6.30 to 9 p.m., and on Mondays at 9.30 a.m.

Major operations are performed on Tuesdays, 9.30 a.m.; Wednesdays, 10 a.m.; Thursdays, 10 a.m.; Fridays, 10.15 a.m. and 2 p.m.; and Saturdays, 9.30 a.m. Minor operations are performed daily (except on Mondays) at 9.30 a.m.

The hospital contains 48 beds for In-Patients. There is an annual Out-Patient attendance of nearly 50,000.

Practitioners and Medical Students are admitted to the Practice of the Hospital at a fee of 5 guineas for three months, 7 guineas for six months, or 10 guineas for Perpetual Studentship. Each course may commence at any date. Special terms are granted to Medical Men in actual practice who can only attend the Hospital once or twice weekly.

From amongst the Students, Junior Clinical Assistants are selected whose duty it is to assist the member of the staff to whom they are appointed. Students are also eligible as Senior Clinical Assistants (4), on whom considerable responsibility falls.

LECTURES.

Three systematic courses of Lectures are given annually: the first during October, November and December; the second during January, February, March; the third during May and June.

A Syllabus of these Lectures can be obtained from the Secretary of the Hospital. They are free to Medical Men and Students on presentation of their cards.

CHARLES A. PARKER, Hon. Med. Sec.

POST-GRADUATE STUDY.

LONDON SCHOOL of CLINICAL MEDICINE

FOR QUALIFIED PRACTITIONERS ONLY.

AT the SEAMEN'S HOSPITAL (Dreadnought, Greenwich), to which are affiliated for teaching purposes the following Hospitals:—

WATERLOO HOSPITAL FOR CHILDREN AND WOMEN.
GENERAL LYING-IN HOSPITAL, York Road.
BETHLEM HOSPITAL.

THREE SESSIONS ANNUALLY commencing 15th January, 1st May, and 1st October. Classes in OPERATIVE SURGERY can be formed at any time. Courses of One Month only may be taken in Clinical work.

For further particulars and complete Syllabus apply to C. C. CHOYCE, the Dean

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GORDON HOSPITAL FOR FISTULA, PILES, CANCER OF THE RECTUM, &c.

VAUXHALL BRIDGE ROAD, LONDON, S.W.

FOUNDED 1884. 26 BEDS.

President—THE RIGHT HON. THE EARL OF BUCHAN.
Treasurer—VINCENT R. HOARE, Esq. *Bankers*—Messrs. Hoare, 37 Fleet Street.

HONORARY MEDICAL STAFF.

Consulting Physician—Sir Francis Henry Laking, Bart, K.C.V.O., M.D., 62 Pall Mall, S.W. *Consulting Surgeons*—F. Bowreman Jessett, Esq., F.R.C.S., 23 Brook Street, Grosvenor Square, W.; Edgar Hughes, Esq., F.R.C.S., 11 Shelley Court, Tite Street, Chelsea, S.W.; Charles Ryall, Esq., F.R.C.S. 62 Harley Street, W. *Surgeons*—C. J. Ogle, Esq., M.R.C.S. 1 Cavendish Place, W.; C. H. Leaf, Esq., F.R.C.S., 75 Whimpole Street, W.; W. E. Miles, Esq., F.R.C.S., 17 Devonshire Place, W.; P. L. Daniel, Esq., F.R.C.S., 152 Harley Street, W. *Surgeon to Out-Patients*—P. Maynard Heath, Esq., M.S., F.R.C.S., 5 Devonshire Street, W. *Anæsthetists*—C. N. Barton, Esq., F.R.C.S., L.R.C.P., 17 Redcliff Gardens, S.W.; W. T. Mullings, Esq., M.D., 84 Belgrave Road, S.W.; F. J. Lawson, Esq., M.R.C.S., L.R.C.P., 66 Belgrave Road, S.W. *Matron*—Miss Mackintosh. *Secretary*—Percy H. Sheffield.

Operations take place on Mondays at 2.30 p.m., on Tuesdays at 2 p.m. and on Wednesdays at 3.30 p.m. The Practice is free to Medical Men and Students. Out-Patients seen daily at 2 o clock; also on Tuesday evenings at 8 o clock. All treatment is free, but In-Patients pay according to their means for maintenance

POST-GRADUATE COLLEGE

(WEST LONDON HOSPITAL),

HAMMERSMITH ROAD, W.

THE HOSPITAL contains 100 beds, all of which are in daily occupation. Over 2300 In-Patients were treated in the Hospital during last year; while the attendances of Out-Patients exceeded 125,000.

The Physicians and Surgeons attend daily at 2.30 p.m. Instruction is given by the Assistant Physicians and Surgeons in the O.P. Department daily at 2.15 p.m.; and there are Special Departments for the Diseases of the Eye, Ear, Throat and Nose, Women, and for Orthopædic Surgery. Post-Graduate Lectures are delivered daily, except Saturdays, at 5 o'clock in the Lecture Room. Special Classes are frequently held in different subjects.

No Students are admitted to the Practice of the Hospital. A Special Building containing Lecture Room, a Reading and Writing Room, &c., is provided for the use of Post-Graduates.

A fully-equipped Clinical Investigation Laboratory and an X-Ray Department have been established at the Hospital. A Special Class in Bacteriology is held about the beginning of each month by the Pathologist. A Certificate signed by the Staff is awarded after three months' Hospital Attendance.

The Fee for the Hospital Practice, including the Post-Graduate Lectures, is £3 3s. for One Month; £6 6s. for Three Months; £10 10s. for Six Months; and £15 15s. for One Year. Full particulars can be obtained from the undersigned at the Hospital.

L. A. BIDWELL, Dean.

THE VICTORIA

UNIVERSITY OF MANCHESTER.

FACULTY OF MEDICINE.

CURRICULUM.—Complete Courses of instruction are offered to Students (Men and Women) preparing for Degrees in Medicine and Surgery, and in Science, for Degrees and Diplomas in Dentistry, for the qualifications of the Conjoint Board and other Licensing Bodies, and for Public Health and Pharmaceutical Diplomas.

The University contains spacious and well-equipped Laboratories in all departments of Science and Medicine. For Women Students a separate Laboratory for Practical Anatomy and Special Common Rooms are provided.

The Prospectus of the Medical Faculty and the special Prospectuses for the following departments: Dental, Public Health, and Pharmaceutical, will be forwarded on application to the REGISTRAR.

Royal College of Surgeons of Edinburgh

FOUNDED 1505.

Copies of the Regulations for the Fellowship, Licence, and Licence in Dental Surgery, with dates of Examinations, Curricula, etc., for the year 1908-9, are now ready, and may be had on application to—

D. L. EADIE, 54, GEORGE SQUARE, EDINBURGH, *Clerk to the College.*

The UNIVERSITY of LIVERPOOL

FACULTY OF MEDICINE.

Complete courses are provided for Degrees in Medicine, Surgery and Dental Surgery, and for Diplomas in Dental Surgery, Public Health, Tropical Medicine, Veterinary Hygiene, and Pharmacy.

Prospectuses regarding the various courses, containing full information as to the Conditions, Fees, Scholarships, Fellowships, etc., may be obtained on application to the Registrar.

K. W. MONSARRAT, M.B., C.M., F.R.C.S., *Dean.*

LIP-READING.

SPEECH FOR THE DEAF.

LESSONS given to persons wholly or partially DEAF, by MISS BOULTBEE, MEMBERS' MANSIONS, VICTORIA STREET, S.W.; where she can be seen by appointment.

UNIVERSITY of ABERDEEN Founded 1494.

FACULTY OF MEDICINE.

THE Degrees in medicine granted by the University are—Bachelor of Medicine, Bachelor of Surgery, Doctor of Medicine, and Master of Surgery. They are conferred only after Examination, and only on Students of the University. Women are admitted to instruction and graduation on the same footing as men. A Diploma in Public Health is conferred after Examination on Graduates in Medicine of any University in the United Kingdom.

The Faculty of Medicine embraces twelve chairs, from which instruction is given in all the main branches of Medical Science.

Practical Classes in connection with these chairs are conducted by the Professors and Assistants in Laboratories furnished with all the necessary appliances; and opportunities are afforded to Students and Graduates to extend their practical knowledge and engage in original research.

Instruction is also given in special departments of Medical Practice by Lecturers appointed by the University Court.

Clinical instruction is obtained in the Royal Infirmary, Royal Lunatic Asylum, the Sick Children's Hospital, the City (Fever) Hospital, the General Dispensary, and Lying-in and Vaccine Institutions, and the Ophthalmic Institutions.

Bursaries, Scholarships, Fellowships and Prizes, to the number of 50 and of the Annual Value of £1183 may be held by Students in this Faculty.

The cost of Matriculation, Class and Hospital Fees for the whole curriculum, inclusive of the fees for the Degrees, is usually about £150.

A Prospectus of the Classes, Fees, &c., may be had on application to the Secretary of the Faculty of Medicine.

DAVID W. FINLAY, M.D., F.R.C.P., *Dean of Medical Faculty.*

RICHMOND, WHITWORTH, and . . . HARDWICKE HOSPITALS, DUBLIN.

THE SESSION 1908–9 commenced on THURSDAY, October 1st, 1908. These Hospitals for Surgical, Medical, and Fever cases respectively, contain nearly 300 beds.

PHYSICIANS—Joseph O'Carroll, M.D., Examiner in Medicine, Royal University.
J. B. Coleman, C.M.G., M.D., Examiner in Medicine, Conjoint Board.
R. Travers Smith, M.D., Examiner, Conjoint Board.

SURGEONS—Sir William Thomson, C.B., F.R.C.S.; Surgeon to the King, and late Surgeon to the Lord Lieutenant in Ireland; late Examiner in Surgery, Army Medical Department.
Sir Thornley Stoker, Ex-President R.C.S.; late Fellow and Examiner in Surgery, Royal University; Surgeon to Swift's Hospital for Lunatics.
Sir Thomas Myles, M.D., F.R.C.S., late President Royal College of Surgeons.

OPHTHALMIC SURGEON—Robert D. Joyce, M.R.C.S.E., L.R.C.P. Lond.

GYNÆCOLOGIST—T. Henry Wilson, Examiner in Midwifery, Conjoint Board.

LARYNGOLOGIST—Oliver Gogarty, M.D., Dublin.

Apply to Sir W. THOMSON, C.B., F.R.C.S., Treasurer, 54, St. Stephen's Green, E.; *or to* Dr. R. TRAVERS SMITH, 20, Lower Fitzwilliam Street, Dublin.

UNIVERSITY COLLEGE OF SOUTH WALES and MONMOUTHSHIRE, CARDIFF.

(A Constituent College of the University of Wales.)

FACULTY OF MEDICINE.

Students may spend three out of the five years of their medical study at this College. The courses of instruction given are recognised as qualifying for the Examinations of the Universities, Royal Colleges, and other licensing bodies of Great Britain and Ireland. Medical men preparing for a Diploma in Public Health and Hygiene can attend complete courses of instruction in these subjects. All classes are open to Women Students. The composition fee for students preparing for the Preliminary Scientific and Intermediate examination in Medicine of the University of London is £57 10s. The composition fee for the classes qualifying for the first and second examinations of the Conjoint Board is £41 10s. The composition fee for the D.P.H. Course is £21. Hospital instruction may be taken at the Cardiff Infirmary, which is situated within five minutes' walk of the College. A course of Lectures to Midwives adapted to the requirements of the Central Midwives Board, under the Midwives Act, was commenced in October, 1904. The Lectures are suitable both for Pupil-Midwives and Practising-Midwives as well as for Nurses who desire to enter for the Examination for Certification under the Act. A prospectus containing all information regarding classes, fees and entrance scholarships may be obtained by application to the Registrar of the College.

Physics—Prof. A. L. Selby, M.A., assisted by J. H. Shaxby, B.Sc., and D. E. Thomas, B.A., B.Sc.
Chemistry—Prof. C. M. Thompson, M.A., D.Sc., assisted by Assist.-Prof. E. P. Perman, D.Sc., and Robert D. Abell, D.Sc.
Zoology—Prof. W. N. Parker, Ph.D., assisted by T. H. Burlend, B.A., B.Sc.
Botany—Prof. A. H. Trow, D.Sc., assisted by M. Y. Orr
Anatomy—Prof. David Hepburn, M.D., C.M., M.R.C.S., F.R.S.Ed., assisted by Evelyn John Evatt, M.B.
Applied Anatomy—Evelyn John Evatt, M.B., B.S.
Physiology—Prof. John Berry Haycraft, M.D., D.Sc. assisted by R. L. Mackenzie Wallis, B.A.
Pharmacology and Therapeutics—W. Mitchell Stevens, M.D., M.R.C.P.
Bacteriology—H. A. Scholberg, M.B., D.P.H.
Public Health and Hygiene—Edward Wallord, M.D., D.P.H., and William Williams, M.A., M.D., D.P.H.
Hygiene Chemistry—J. H. Sugden, M.Sc., F.I.C.
Midwifery (for Midwives)—E. J. Maclean, M.D., M.R.C.P.

J. AUSTIN JENKINS, B.A., Registrar of the College.
DAVID HEPBURN, M.D., C.M., M.R.C.S., Dean of the Faculty of Medicine.

University College, BRISTOL.

FACULTY OF MEDICINE.

THIS COLLEGE is the only Institution in the West of England which provides a complete Medical Curriculum.

The lectures and instruction given in the Faculty of Arts and Science of University College, Bristol, are adapted to the Preliminary Scientific Examinations of the University of London and the Conjoint Board; and Students can complete in Bristol the entire course of study required for the Medical and Surgical Degrees of the University of London, the Diplomas of the Royal College of Physicians of London and the Royal College of Surgeons of England, and the Apothecaries' Society of London.

Women are admitted to all parts of the Medical Curriculum on the same terms as men.

A complete Dental Curriculum is also provided.

Students of the College are now admitted to the clinical practice of the Bristol Royal Infirmary and the Bristol General Hospital conjointly.

The Infirmary and the Hospital comprise between them a total of 470 beds; and both have very extensive Out-patient Departments, Special Departments for the Diseases of Women and Children, and of the Eye, Ear and Throat, besides large Out-Door Maternity Departments, and Dental Departments.

Students of the College also have the privilege of attending the practice of the Bristol Royal Hospital for Sick Children and Women, containing 104 beds, and that of the Bristol Eye Hospital, with 30 beds. The total number of beds available for Clinical Instruction is therefore 614.

Fever Hospital Practice is attended at the Hospitals for Infectious Diseases of the Sanitary Authority of the Corporation of Bristol; and Lunatic Asylum Demonstrations at the City and County Lunatic Asylum, Fishponds.

Very exceptional facilities are thus afforded Students for obtaining a wide and thorough acquaintance with all branches of Medical and Surgical work. Each student has the opportunity of personally studying a large number of cases, and of acquiring practical skill in diagnosis and treatment.

FEES.—Composition Fee for the entire curriculum, including Hospital Practice, 133 Guineas. Dental Composition Fee 75 Guineas for the entire curriculum. If two years' Mechanical Dentistry be taken as well, the Composition Fee is 140 Guineas.

If the Composition Fee has not been paid, Perpetual Medical and Surgical Practice 20 Guineas each. Fever Hospital Practice and Lunatic Asylum Demonstrations, 3 Guineas each.

Scholarships and Prizes.—Numerous valuable Scholarships and Prizes are offered for Competition.

Entrance Scholarship.—Value £75.

Special Six Months' Course for Diploma in Public Health.—Composition Fee, 25 Guineas.

Medical Library.—Students have the use of a large and important collection of books consisting of over 2,000 volumes.

Prospectus and all particulars may be obtained on application to—

JAMES RAFTER, *Registrar and Secretary; or to*
EDWARD FAWCETT, M.D., *Dean.*

UNIVERSITY OF DURHAM

COLLEGE OF MEDICINE, NEWCASTLE-ON-TYNE.

DEGREES IN MEDICINE, SURGERY, AND HYGIENE.—Six Degrees and one Diploma are conferred by the University of Durham—*viz.*, the Degrees of Bachelor of Medicine, Doctor of Medicine, Bachelor of Surgery, and Master of Surgery; Bachelor in Hygiene, and Doctor in Hygiene; and Diploma in Public Health. These Degrees are open to Men and Women.

Attendance at the University of Durham College of Medicine during one of the five years of professional study, or subsequently to qualification elsewhere, is required as part of the curriculum for the Degrees, except in the case of Practitioners of more than fifteen years' standing, who have attained the age of forty years, who can obtain the Degree of M.D. after examination only.

The first three Examinations for the Degree of M.B. may be passed prior to the commencement of attendance at Newcastle.

A candidate who has passed the First and Second Examinations of the University will be exempt from the First and Second Examinations of the Conjoint Board in England, and will be entitled to present himself for the Final Examination of the Board on the completion of the necessary curriculum. Students who have satisfied the requirements of the General Medical Council as regards Registration, in some Examination other than the Durham Matriculation, or its equivalent, may enter on a course of study for a degree in Medicine upon satisfying the Examiners of the University of Durham in any *three* of the subjects of the Matriculation Examination, provided that one of them at least is a language other than English. In the case of a Student who spends only one year at Newcastle, the necessary subjects of the Matriculation Examination must be passed at least 12 months previously to the candidate's entry for his Final Examination for the Degree.

Students can complete, at the University of Durham College of Medicine, Newcastle-upon-Tyne, the entire course of professional study required for the above degrees and for the Diploma in Public Health; also for the examinations of the Royal Colleges of Physicians and Surgeons, and for the Army and Navy Examination Boards.

A Dental curriculum is provided.

All information, together with Examination Papers, etc., is given in the Calendar of the University of Durham College of Medicine, Newcastle-upon-Tyne, which may be obtained gratis from the Secretary at the College.

Scholarships, &c.—University of Durham Scholarship, value £100 for proficiency in Arts, awarded annually to full students in their first year only. The Pears Scholarship—value £150—for proficiency in Arts. The Masonic Scholarship—value £45—for proficiency in Arts. Dickinson Scholarship—value the interest of £400, and a Gold Medal—for Medicine, Surgery, Midwifery, and Pathology. Tulloch Scholarship—value the interest of £400—for Anatomy, Physiology, and Chemistry. Charlton Scholarship—value the interest of £700—for Medicine. Gibb Scholarship—value the interest of £500 for Pathology. Luke Armstrong Scholarship—interest on £680—for Comparative Pathology. Stephen Scott Scholarship—interest on £1000—for promoting the study of Surgery and allied subjects. Heath Scholarship—the late George Yeoman Heath, M.D., M.B., D.C.L., F.R.C.S., President of the University of Durham College of Medicine, bequeathed the sum of £4000 to found a Scholarship in Surgery, the interest to be awarded every second year. Gibson Prize—value the interest of £225—for Midwifery and Diseases of Women and Children. The Turnbull Prize and Medal—for Surface Anatomy. The Goyder Memorial Scholarship (at the Infirmary)—value the interest of £325—for Clinical Medicine and Clinical Surgery. At the end of each Session a Prize of Books is awarded in each of the regular Classes. Assistant Demonstrators of Anatomy, Prosectors, and Assistant Physiologists are elected yearly. Pathological Assistants, Assistants to the Dental Surgeon, Assistants in the Eye Department, Clinical Clerks, and Dressers are appointed every three months.

The Royal Victoria Infirmary contains over 400 beds. Clinical Lectures are delivered by the Physicians and Surgeons in rotation. Pathological Demonstrations are given as opportunity offers, by the Pathologist; Practical Midwifery can be studied at the Newcastle Maternity Hospital, where there is an Out-door Practice of about 1000 cases annually.

FEES.

(*a*) A composition Ticket for Lectures at the College may be obtained
I.—By payment of 72 guineas on entrance.
II.—By payment of 46 guineas at the commencement of the First Year, and 36 guineas at the commencement of the Second Year.
III.—By three annual instalments of 36, 31, and 20 guineas respectively, at the commencement of the Sessional year.

(*b*) Fees for attendance on Hospital Practice:

	£	s.	d.
For 3 months' Medical and Surgical Practice	5	5	0
,, 6 ,,	8	8	0
,, 1 year's	12	12	0
,, Perpetual	26	5	0

Or by three instalments at the commencement of the Sessional year, *viz.*, First year, 12 guineas; Second year, 10 guineas; Third year, 6 guineas. Or by two instalments—First year, 14 guineas; Second year, 12 guineas.

In addition to the above fees, the Committee of the Royal Victoria Infirmary require the payment of 2 guineas yearly up to three years from every Student attending the Infirmary for a year or part of a year. After three years of attendance, such payment will be no longer necessary.

(*c*) Single courses of Lectures, 5 guineas.

(*d*) A Composition Ticket for the courses of Lectures and Practical work of the first two years of the curriculum, may be obtained by the payment of 40 guineas on entrance.

Fees for Lectures, etc., at the College must be paid to the Secretary, and Fees for Hospital Practice to Dr. H. B. ANGUS at the time of entry.

Further particulars may be obtained from the Sec., PROF. HOWDEN, at the College.

UNIVERSITY OF EDINBURGH.

SESSION 1908—1909.

Principal—Sir WILLIAM TURNER, K.C.B., D.C.L., LL.D., M.B., etc.

The WINTER SESSION opens on 1st October, and closes on 19th March; the SUMMER SESSION opens on 1st May, and closes about the middle of July.

FACULTY OF MEDICINE.

Dean—Professor D. J. CUNNINGHAM, D.C.L., LL.D., M.D., D.Sc.

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Physics—C. G. Knott, M.A., D.Sc.
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Medical Entomology and Protozoology—J. H. Ashworth, D.Sc.
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Clinical Instruction in Infectious Fevers—Alexander James, M.D., and Claude B. Ker, M.D.
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Physician for Diseases of the Skin—Dr. Norman Walker.
Assistant Physicians—Dr. G. Lovell Gulland; Dr. J. J. Graham Brown; Dr. Francis D. Boyd; Dr. R. A. Fleming; Dr. H. Rainy; Dr. Chalmers Watson; Dr. Edwin Bramwell.
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Assistant Medical Electrician—Dr. W. Hope Fowler.
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Dental Surgeons—Mr. Wm. Guy; Mr. J. H. Gibbs.
Assistant Surgeons—Mr. Alexis Thomson; Mr. Alexander Miles; Mr. John W. Dowden; Mr. A. A. Scot-Skirving; Mr. George L. Chiene; Mr. W. J. Stuart.
Assistant Ophthalmic Surgeons—Dr. J. V. Paterson; Dr. A. H. H. Sinclair.
Assistant Surgeons to Ear and Throat Department—Dr. John S. Fraser; Dr. John D. Lithgow.
Pathologist—Dr. Theodore Shennan.
Assistant Pathologists—Dr. W. T. Ritchie; Dr. W. C. Dickson; Dr. J. D. Comrie.
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2. Non-Resident Physicians and Surgeons or Clinical Assistants, who must also be registered as legally qualified Practitioners, are appointed by the Managers on the recommendation of the Physicians and Surgeons. The appointment is on the same terms as that of Resident Physicians and Surgeons.

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FACULTY OF MEDICINE.

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Zoology, Systematic and Practical—Professor MacIntosh
Anatomy, Systematic and Practical—Professor Musgrove
Physiology, Systematic and Practical—Professor Herring

UNIVERSITY COLLEGE, DUNDEE.

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Chemistry, Systematic and Practical—Prof. H. Marshall
Zoology, Systematic & Practical—Prof. D'Arcy W. Thompson
Botany, Systematic and Practical—Prof. Geddes
Anatomy, Systematic and Practical—Principal Mackay
Histology—Lt.-Col. Lamont, I.M.S. retd.
Physiology, Systematic and Practical—Prof. Waymouth Reid
Pharmacology and Materia Medica—Prof. C. R. Marshall
Pathology and Bacteriology—Prof. Sutherland
Systematic Medicine—Prof. Stalker
Systematic Surgery—Prof. Mackwan
Midwifery and Diseases of Women—Prof. Kynoch
Medical Jurisprudence and Public Health—Dr. Templeman
Clinical Medicine—Prof. Stalker and Dr. Whyte
Clinical Surgery—Prof. MacEwan and Mr. Greig
Operative Surgery—Prof. MacEwan
Clinical Gynæcology—Prof. Kynoch & Dr. Buist
Practical Midwifery—Prof. Kynoch & Dr. Buist
Diseases of Children—Mr. Greig and Dr. Rogers
Ophthalmology—Dr. M'Gillivray
Mental Diseases—Dr. Rorie and Dr. Mackenzie
Diseases of Nose, Throat, and Ear—Dr. Guild
Diseases of the Skin—Dr. Foggie
Physical Diagnosis Classes—Prof. Marshall, Drs. Foggie, Kerr, and Millar
Post-mortem Examinations—Prof. Sutherland and Dr. Fraser
Vaccination—Dr. R. Cochrane Buist

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CLINICAL INSTRUCTION is given at the Dundee Royal Infirmary, which has 400 beds, with special wards for Maternity cases, Diseases of Women, Diseases of Children, Diseases of the Eye, Diseases of the Ear, Throat, and Nose, Diseases of the Skin, Cancer, and for cases requiring electrical treatment. Further instruction in Diseases of the Eye is given at the Dundee Eye Institution, which is attended by over 4000 patients annually. Clinical Instruction in Fevers is given at the Municipal Fever Hospital; and clinical instruction in Mental Diseases at the Dundee District Asylum, which has about 400 resident patients.

APPOINTMENTS.—Five Resident Medical Assistants, and an Outdoor Obstetric Assistant are appointed annually at the Dundee Royal Infirmary. At the District Asylum the appointments include two qualified Resident Medical Assistants and two Resident Clinical Assistants.

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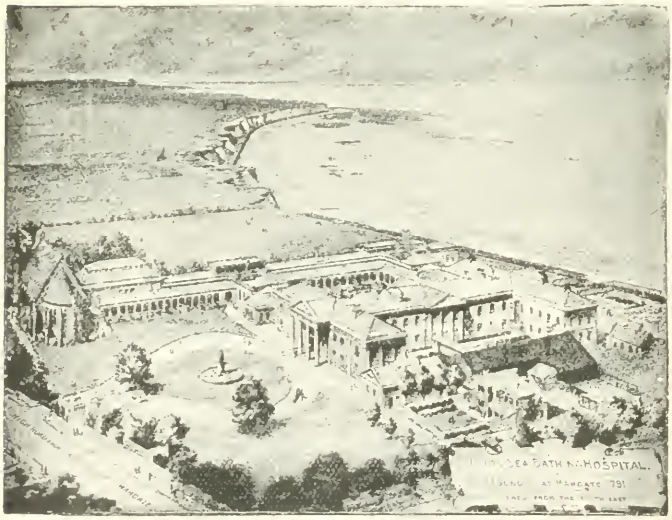

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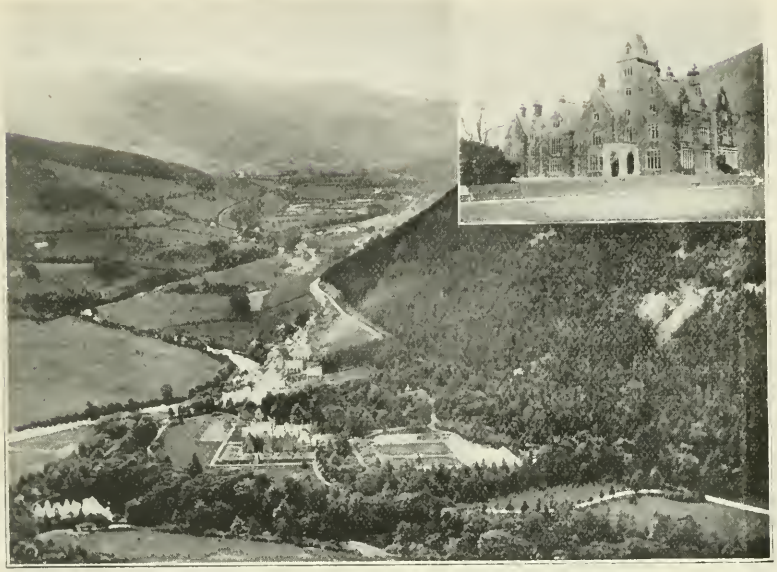

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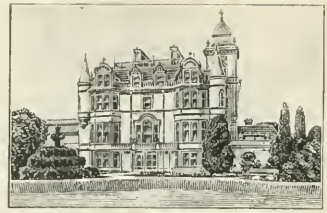

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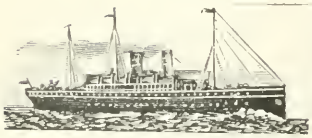

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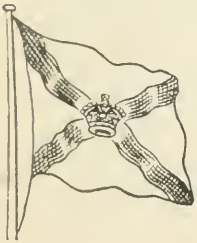

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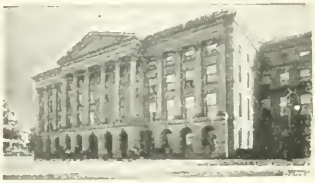

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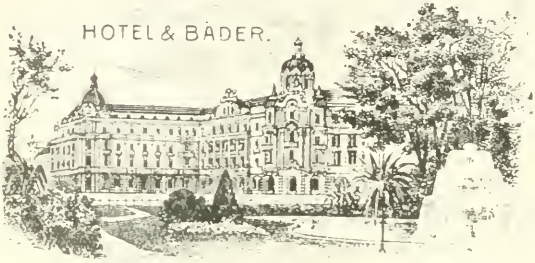

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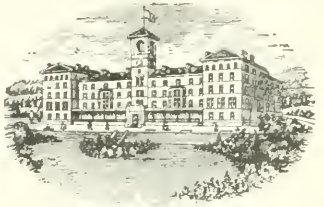

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Golf, Fishing, 45 acres of Private Grounds and Pine Woods.

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ELECTRIC TRAMS now running from the House to Southport.

Recently added—Electric Lift, Splendid Lounge, and New Dining Room.

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500 FEET ABOVE SEA LEVEL.
Turkish & Russian Baths, Static Electricity, High Frequency Currents, X-Rays, Radiant Heat, and Vibratory Massage.

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NEWTON-LE-WILLOWS, LANCASHIRE.

TELEGRAPHIC ADDRESS:—"STREET, ASHTON-IN-MAKERFIELD" (two words only).
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A PRIVATE MENTAL HOSPITAL FOR THE MIDDLE AND UPPER CLASSES ONLY, EITHER VOLUNTARILY OR UNDER CERTIFICATES.

Terms from 31/6 per week.

HAYDOCK LODGE is a large Country Mansion especially adapted for the Care and Treatment of Persons of Unsound Mind, having been enlarged and rebuilt on plans sanctioned and approved by the Commissioners in Lunacy. It is charmingly situated in a healthy and retired neighbourhood, standing in its own well-timbered park of nearly 100 acres, with attached Farm, Gardens, extensive Vineries, Conservatories, Lawn for Tennis, Cricket, Football, Bowls, Croquet and Golf. NEWTON-LE-WILLOWS (a first-class station on the L. & N.-W. Ry., midway between Liverpool and Manchester) is two miles distant, where conveyances are always to be had.

The accommodation provided is spacious, comfortable, and home-like, comprising Drawing Rooms for the Ladies, Smoking and Reading Rooms for the Gentlemen, together with large Dining Room, Billiard Room, Library, and Ball Room, as well as a number of suitable private Sitting and Bed Rooms for those who desire them. The Sanitary Arrangements are complete, with convenient Bath Rooms and Lavatories. An old part of the House, which has for many years been uninhabited, has recently been entirely reconstructed, forming a large Baronial Hall, with adjoining Billiard and Smoking Rooms, and Lavatories fitted with all the latest sanitary improvements—the whole affording greatly improved accommodation for Gentlemen. A Hospital has also been added to the Ladies' side of the House, which has greatly facilitated the treatment of the Sick and Feeble. Concerts, Balls, Entertainments, and Reunions are held frequently in the large Ball Room. "Table d'Hote," presided over by the Medical Superintendent, his Assistant, and the Ladies' Companion, is provided for those who are mentally able to appreciate its amenities.

The Parish Church is within easy distance, and besides Daily Prayers, Service is held in the House every Sunday by the Chaplain. Carriages are kept for the use of the Patients, and those whose condition will allow, and whose friends desire it, spend some time annually at the seaside. Terms vary from 31s. 6d. to 6 guineas a week. Patients of both sexes can have private apartments and special attendants if required. Voluntary Boarders received without certificates.

Haydock Lodge has also associated with it establishments at **MARSDEN HALL**, in the Coln District of North Lancashire, **GRETA BANK** (for ladies only) in the Craven district of Yorkshire, near Ingleton, and **OVERDALE**, near Manchester, under the management of P. G. MOULD, L.R.C.P., M.R.C.S., late A.M.O. at Cheadle Royal Asylum.

Information as to terms, etc., may be obtained from the
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Resident Medical Licensee .....A. E. CHAMBERS, L.R.C.P.Lond., M.R.C.S.Eng.

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Liverpool University.

MRS. STANLEY GILL, & MISS VIOLET FLORENCE GILL.

Visiting Physician:

T. R. GLYNN, M.D., F.R.C.P. Lond.,
Consulting Phys. Liverpool Infirm., & Prof. of Med. Univ. Coll. Liverpool.

THIS House, specially built and licensed for the care and treatment of a limited number of Ladies and Gentlemen mentally afflicted, is delightfully situated near the coast between Liverpool and Southport, so that patients have the benefit of pure bracing sea air, for which Formby is noted. The House is in the country, and stands in several acres of ornamental well-wooded grounds, the surroundings being in every way bright, cheerful and pleasant. As the Licensees reside on the premises they are able to devote the whole of their time to the constant supervision of the patients. All kinds of out- and in-door amusements and occupation provided. Voluntary Boarders without certificates admitted. Terms moderate.

The Licensees have also a Private Residence at Deganwy, North Wales, for the treatment of mild borderland and convalescent patients.

The ASYLUM, WITHAM,
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A PRIVATE INSTITUTION

Licensed for the reception of PATIENTS OF BOTH SEXES. Standing in its own grounds of twelve acres, one hour from London on main Great Eastern Line.

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Telegrams: "DICKSON, BUXTON." *National Telephone:* 13, BUXTON.

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Care and Treatment of the INSANE of the Higher and Middle Classes.

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Chaplain: REV. C. C. NATION, M.A. (Vicar of Buxton and Rural Dean).

THIS Institution has been established for the **Reception of Patients of Both Sexes of the Higher and Middle Classes**, for whom it is admirably adapted by its position and appointments. It is erected on an eminence surrounded with scenery of the most varied character, and the views from the House and Terraces extend over many miles of picturesque country. There is also in connection a Summer Residence on the coast of North Wales. The House is furnished throughout on the most liberal scale, and fitted up and arranged as a Gentleman's Family Residence. Voluntary Boarders can be received.

The Sanitary arrangements and Ventilation are modern in design and *perfect* in construction, and are certified to be so by the Sanitary Authority.

The Medical Superintendent lives in the House, and is assisted in his duties by a Resident Assistant Physician, and an experienced Lady Superintendent.

Every exertion is made to promote health and comfort, both by moderate bodily employment and by variety in amusements, such as reading, music, drawing, excursions, golf, billiards, croquet, lawn tennis, theatricals, re-unions, etc. A library is provided, containing some 2,000 works of varied character, suited to the condition of the patients; also periodicals, magazines, and newspapers. Motor exercise is provided.

Due provision is made for the spiritual welfare and consolation of the Patients, and Divine Service is held every Sunday in the Institution.

The Pleasure Grounds, which are very spacious, have been laid out in the most tasteful manner especially for the recreation of the Patients; and contain conservatories, lawns for croquet and tennis, a private golf course, and other out-door games; also a theatre, two billiard rooms, and workshop for the in-door occupation of Patients. The House is heated throughout by means of hot-water apparatus and open fireplaces.

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Particulars of Terms and Forms of Admission on application to THE MEDICAL SUPERINTENDENT.

ESTABLISHED 1814.

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Four miles from Charing Cross; easy of access from all parts; a quarter of an hour's walk from Finsbury Park Station (G.N.R.), from which Trams pass the gates.

Six acres of ground, highly situated, facing Finsbury Park.

Private Villas, in suites of rooms.

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For further particulars apply to RESIDENT PHYSICIAN.

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An old-established and modernized Institution for the Medical Treatment of Ladies and Gentlemen Mentally Afflicted.

THE House, pleasantly situated, stands in picturesque grounds of forty acres in extent, with a surrounding country noted for the beauty of its walks and drives. The climate is genial and bracing. Occupation, indoor and outdoor amusements, and carriage and other exercise amply provided.

TERMS range from **3** to **7** guineas per week, inclusive, according to requirements as to accommodation, special attendance, etc.

Railway Stations: Stourbridge Junction (G.W.R.), 3½ miles; Dudley (L. & N.W.R.), 4 miles; Wolverhampton (G.W.R. or L. & N.W.R.), 7 miles. Intending visitors can be met at any of these Stations.

For further particulars apply to the MEDICAL SUPERINTENDENT.

Incorporated by Royal Charter.

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Chairman—The Rt. Hon. The Earl of Mansfield.

THIS Asylum, for Private Patients only, is beautifully situated in the immediate vicinity of Perth, in the midst of extensive Pleasure Grounds, which are surrounded by the fields of the Home Farm.

The Main Building has been entirely re-organized and enlarged by the addition of *two wings*, for the reception of acute cases, so as to render it an efficient *Hospital* as well as a comfortable *Home*.

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National Telephone Company: No. 104, Perth.

Postal and Telegraphic Address: Dr. Urquhart, Perth.

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A Registered Hospital for the CURE and CARE of the INSANE and of NERVOUS INVALIDS of the MIDDLE and UPPER CLASSES.

THIS Institution is situated in a beautiful and healthy locality, within easy reach of London. It is fitted with every comfort. Patients can have Private Rooms and Special Attendants, as well as the use of General Sitting Rooms, at moderate rates of payment. Voluntary Boarders not under Certificates can be admitted. There is a branch establishment at Brighton, where Patients and Boarders can be sent for a change, and provided with all the comforts of a well-appointed home.

For Terms, apply to the RESIDENT MEDICAL SUPERINTENDENT,
St. Ann's Heath, Virginia Water, SURREY.

WESTERMAINS PRIVATE ASYLUM,
KIRKINTILLOCH,
NEAR GLASGOW.
FOR LADIES.

Terms:—EIGHTY GUINEAS AND UPWARDS.

Apply—Mr. LAWRIE, Resident Proprietor.

QUIET CASES ONLY RECEIVED.

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A REGISTERED HOSPITAL for the UPPER and MIDDLE CLASSES.

This Institution is situated in a beautiful and healthy locality, within a short distance of the City of Exeter. There is comfortable accommodation at moderate rates, both in the Hospital itself and at Plantation House, Dawlish, a seaside residence on the South Devon Coast, affording more privacy, with the benefits of sea air and a mild and salubrious climate. Private rooms and Special Attendants provided, if required. Voluntary Patients or "Boarders," not under certificates, also received.

FOR TERMS, ETC., APPLY TO—

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STRETTON HOUSE,

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A Private Licensed House for the treatment of Gentlemen suffering from any sort of Mental Disease.

ESTABLISHED 1853.

SITUATED amongst charming scenery, 600 ft. above the sea, large grounds, pure water, perfect sanitation, and the bracing air of the "English Highlands."

Accessible from all parts. Good train service on G.W. and L. & N.W.R. Station within one mile.

Constant occupation and congenial recreation are specially attended to, and all sorts of indoor and outdoor amusements are provided.

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For the Terms, which are moderate, apply to the RESIDENT MEDICAL PROPRIETOR.

Telegrams—Stretton House, Church Stretton. *Telephone*—P.O. 10, Church Stretton.

THE RETREAT, YORK. *ESTABLISHED 1792.*

A Registered Hospital for the Treatment of Mental Diseases.

Under the management of a Committee of Members of the Society of Friends. Situated about two miles from York Station. The Patients are derived from the **Upper and Middle Classes**, and none are paupers or rate-aided. **Terms from 48 - weekly.**

Voluntary Boarders are received on their own application. Nurses who have been trained at least three years are available for private nursing.

For further particulars as to the resources of the Institution, and information respecting the admission of Patients, see the Annual Report, which will be sent on application to Dr. BEDFORD PIERCE, the Medical Superintendent. *Nat. Telephone:* 112 York.

THROXENBY HALL, Near SCARBOROUGH.

A Branch House connected with The Retreat, York, situated near the Raincliffe Woods, about two miles from Scarborough, for the reception of **Convalescent Patients**, also for the treatment of persons suffering from **Incipient or Mild Forms of Mental Disorder** who cannot be certified as of unsound mind, and who wish voluntarily to place themselves under skilled treatment. —For further particulars apply to the Matron, or to DR. BEDFORD PIERCE, at THE RETREAT, YORK. *Nat. Telephone:* 282 Scarborough.

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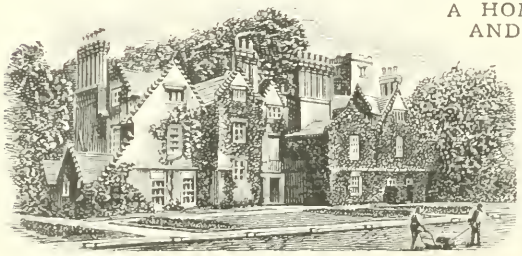
STATIONS: L. & N. WEST. and MID. RAILWAYS.



A HOME FOR NERVOUS AND MENTAL CASES.

The House stands in grounds of ten acres (within 5 minutes' drive of either Station), and is devoted to the Care and Treatment of a few Ladies suffering from Nervous and Mental Disorders, who enjoy the comforts, privacy, and occupations of home-life. Voluntary Patients are received without Certificates.

For terms, etc., apply to the Resident Proprietor,

E. HOLLINS, M.A. Camb., J.P.

BOREATTON PARK

THIS PRIVATE ASYLUM, which was founded by the late W. H. O. SANKEY, M.D., F.R.C.P., for the reception of a limited number of

Ladies and Gentlemen MENTALLY AFFLICTED,

is now conducted on the same lines by his son, E. H. O. SANKEY, M.A., M.B., B.C., Cantab.

The Ladies' Division is directly supervised by Mrs. SANKEY.

The Mansion stands high, among handsomely laid out gardens in the midst of a picturesque deer park (about 70 head of deer are kept), and commands a magnificent view of Welsh mountain scenery.

Carriages, horses, lawn-tennis, golf, trout and other fishing are provided.

Arrangements can be made to enable friends of patients to reside in the House as Boarders if so desired.

The Asylum is situate about ten miles from Shrewsbury, within easy distance of Baschurch Station, G.W.R., whither carriages can be sent at any time for visitors.

Letters and Telegrams should be addressed to

DR. SANKEY, Boreatton Park, BASCHURCH, SALOP.

COTON HILL

HOSPITAL FOR THE INSANE,

NEAR STAFFORD.

Chairman of the Committee of Management—

THE RIGHT HONOURABLE THE EARL OF DARTMOUTH.

This Hospital, which is beautifully situated in a high and healthy position, with extensive grounds, Cricket Field, Lawn Tennis Courts, Golf Links, etc. is devoted to the Care and Treatment of the Mentally Afflicted of the Upper and Middle Classes.

PRIVATE ROOMS with Special Attendants in the Hospital, or semi-detached Villas in the grounds, can be arranged. **Terms on Application.**

For further Particulars apply to **R. W. HEWSON,** *Medical Superintendent.*

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FEMALE PRIVATE PATIENTS.

A SEPARATE and DETACHED BLOCK has just been opened. Terms: **One Guinea per week**, which includes everything except clothing. This Building is distinct from the main Asylum, and has separate recreation grounds.

For further particulars, apply to the Medical Superintendent,

Dr. S. R. MACPHAIL, Rowditch, DERBY

SPRINGFIELD HOUSE,

NEAR BEDFORD.

(TELEPHONE No. 17. **Within an hour of London by Midland.**)

An Institution for the

CARE AND CURE OF THE INSANE.

Under the Personal Direction of the Licensees

DAVID BOWER, M.D.

(Late Resident Medical Superintendent of Saughton Hall Asylum, Edinburgh;)

MR. W. S. BOWER AND MISS BELLARS,

(ASSISTED BY LADIES' AND GENTLEMEN'S COMPANIONS.)

DR. BOWER attends at 5, Duchess Street, Portland Place, W., on Tuesdays, from 4 to 5.

Ordinary Terms = Three Guineas per week.

Vacancies are advertised each week in the *British Medical Journal* and the *Lancet*.

BETHEL HOSPITAL, NORWICH.

ESTABLISHED A.D. 1713.

THIS Institution is an endowed Hospital, registered under the Lunacy Acts, and managed by a Board of Governors who have no pecuniary interest in its success, but whose sole object is to promote the comfort and well-being of the Patients.

The Hospital is arranged for both sexes, and is especially adapted for those whose means will not permit of their being sent to an expensive and luxurious Institution for the Insane, and who may object to the associations of a pauper asylum.

The terms for admission are **thirty shillings per week or more**, according to Patients' condition and circumstances, which includes everything, except clothing, carriage exercise, or any expenses incurred for amusement beyond the Hospital grounds.

CONSULTING PHYSICIAN:
SAMUEL J. BARTON, Esq., M.D.
(Consulting Physician to the Norfolk and Norwich Hospital).

RESIDENT MEDICAL SUPERINTENDENT:
JAMES FIELDING, M.D., M.R.C.S. Eng., L.R.C.P. Edin.

CLERK TO THE GOVERNORS:
FRANCIS HORNOR, QUEEN STREET, NORWICH.

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MISS OXLEY *(Late Sister Guy's Hospital, London).*

APPLICATION FOR ADMISSION TO BE MADE TO THE
Resident Medical Superintendent, BETHEL HOSPITAL, NORWICH.

MIDDLETON HALL,

MIDDLETON ST. GEORGE,
Near DARLINGTON, Co. DURHAM.

PRIVATE ASYLUM FOR THE CARE AND TREATMENT OF LADIES AND GENTLEMEN.

THE HOUSE, which stands amid well-wooded grounds, in a healthy and pleasant country in the valley of the Tees, has been recently erected from plans approved by the Commissioners in Lunacy, and embodies all the latest improvements in the construction of Homes for the Nervous and Mentally Afflicted. The building is **fire-proof**, and lighted throughout by electricity, and the heating is aided by a system of steam pipes.

Private sitting rooms and special attendants are provided if required.

Voluntary Boarders, not under certificates, can be received.

Terms to be had on application to—

L. HARRIS-LISTON, M.D., Medical Superintendent.

THE PLEASAUNCE,

YORK.

A Private Home for Ladies only of the upper and middle classes.

Ladies can be received either as voluntary patients or certified under the Lunacy Act, 1890.

Apply to Dr. SWANSON, Resident Medical Proprietor.

GROVE HOUSE,

ALL STRETTON, CHURCH STRETTON, SHROPSHIRE.

A PRIVATE HOME for the Cure and Treatment of a limited number of LADIES MENTALLY AFFLICTED.

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Dr. EAGER *or* Dr. THOMAS *attends at* 64, *PARK STREET, BRISTOL, on Mondays and Thursdays, from* 12 *to* 3 *o'clock.*

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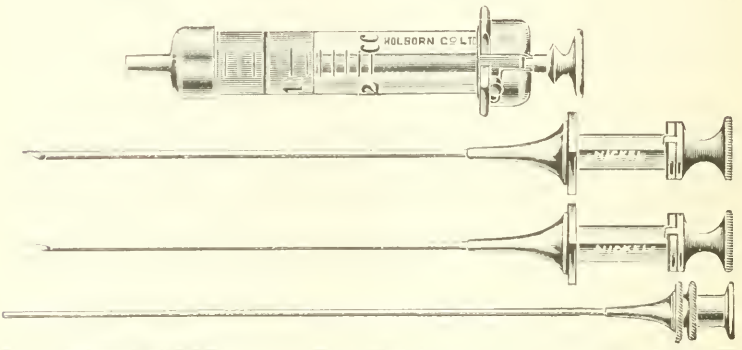

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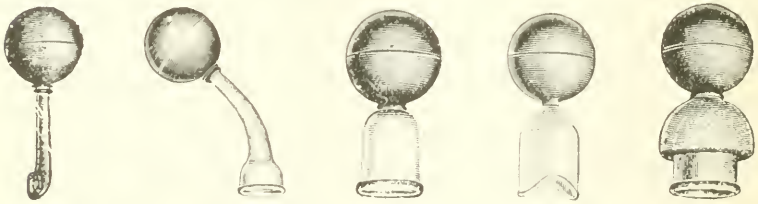

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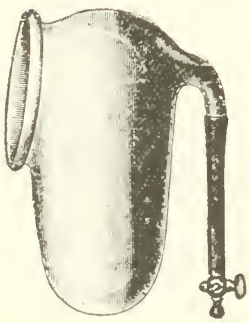

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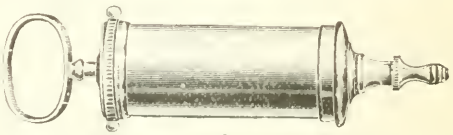

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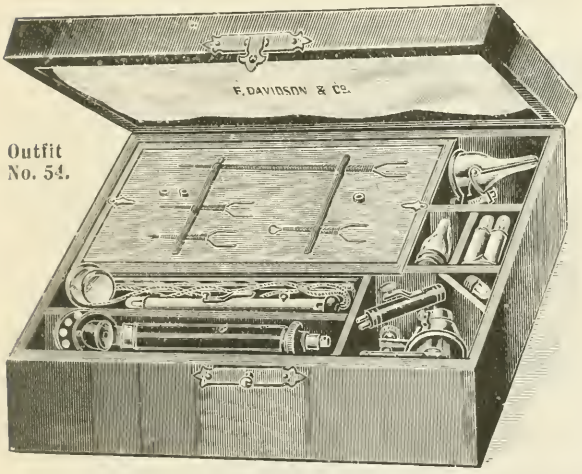

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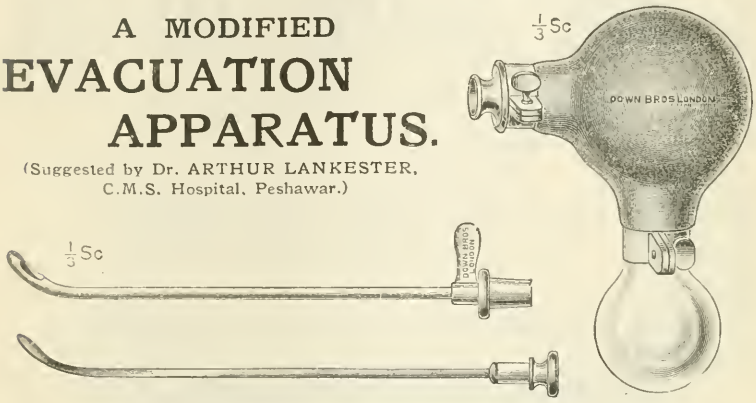

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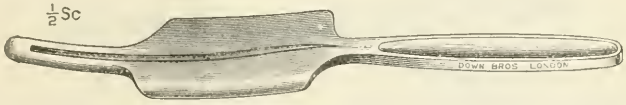

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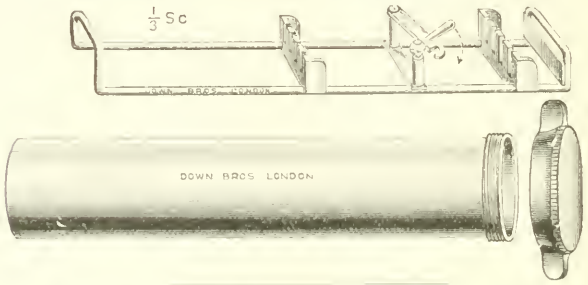

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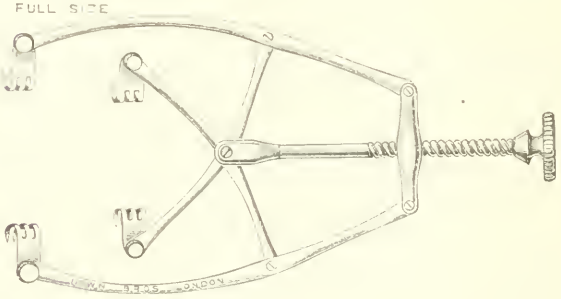

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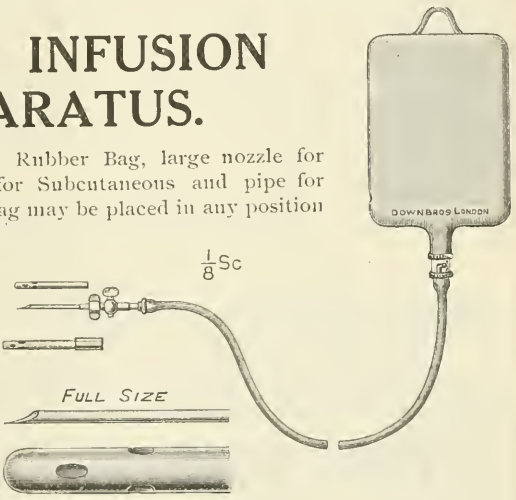

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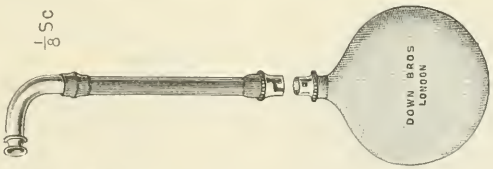

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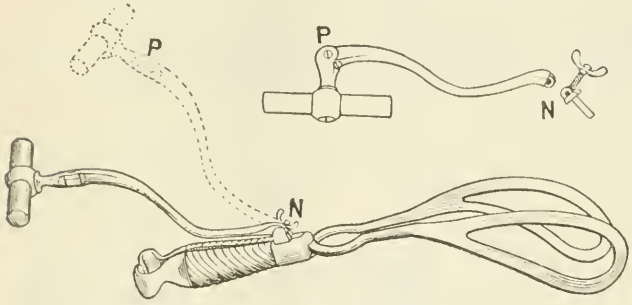

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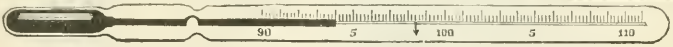

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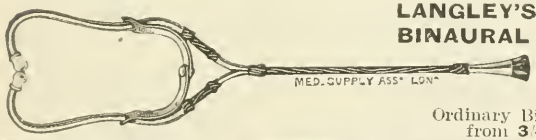

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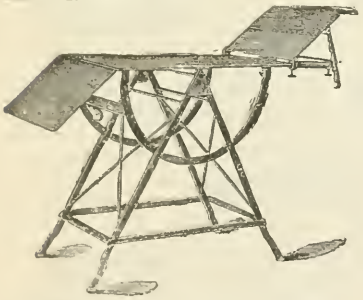

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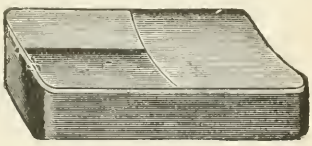

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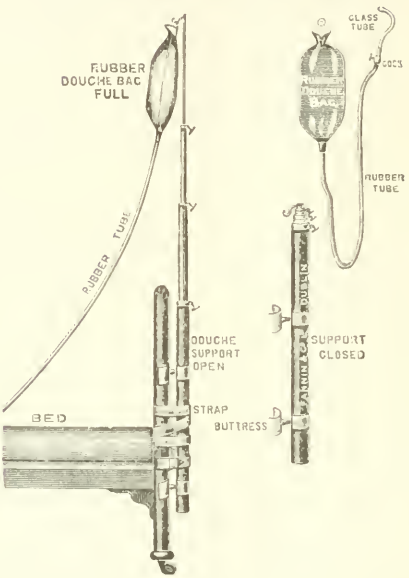

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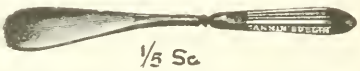

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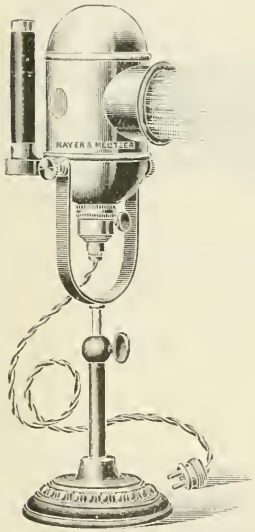

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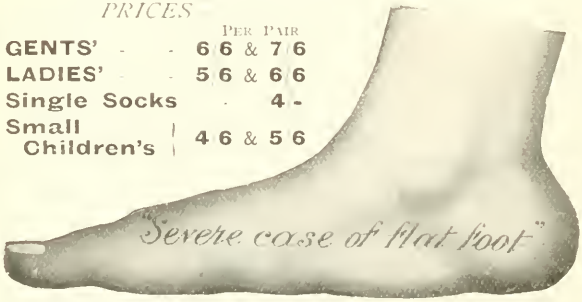

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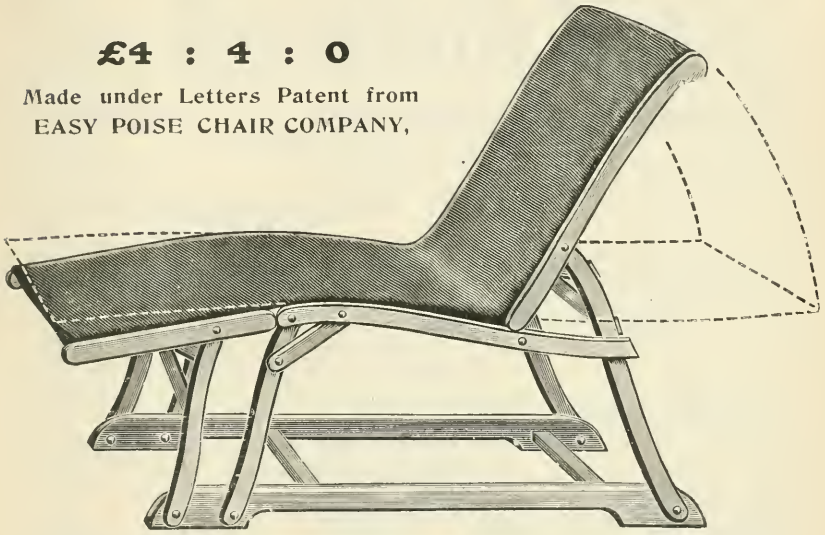

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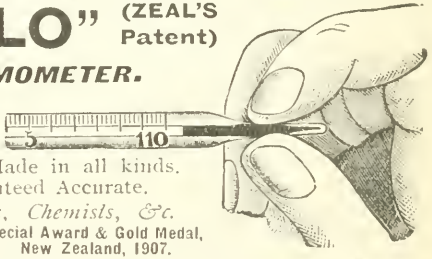

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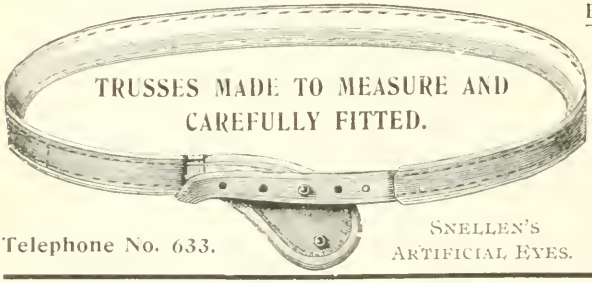

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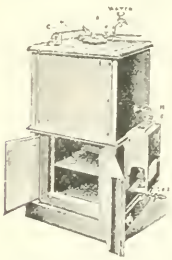

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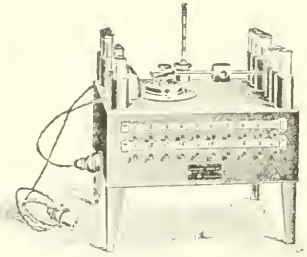

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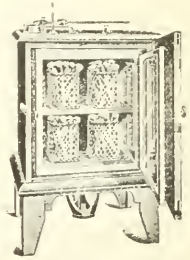

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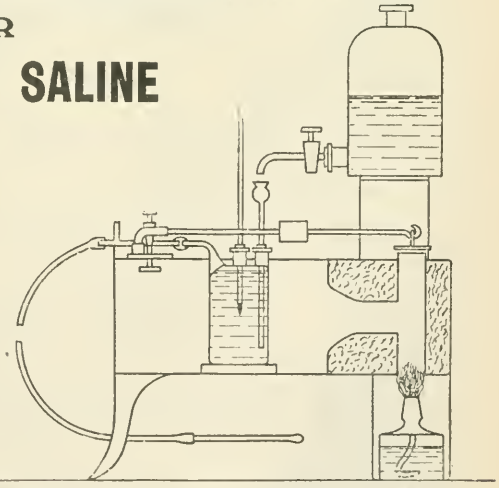

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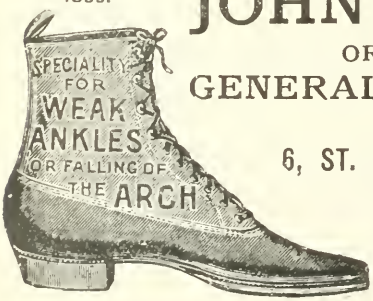

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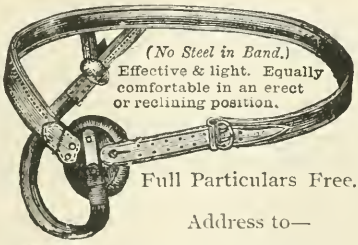

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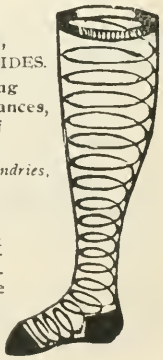

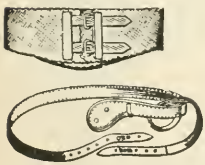

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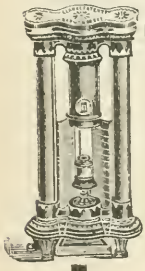

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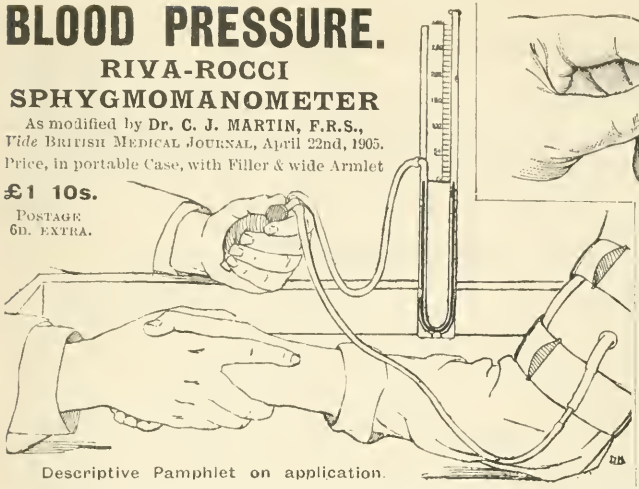

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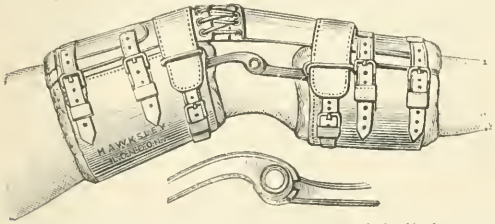

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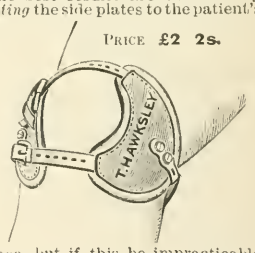

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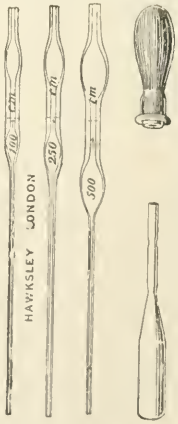

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